Department of Defense

Sustainable Planning

A Multi-Service Assessment 1999

ARMY | NAVY | AIR FORCE | MARINE CORPS

Sustainable Planning:

A Multi-Service Assessment 1999

Feasibility Study for Implementing Sustainable Development Concepts and Principles into the Army, Navy, Air Force and Marine Corps Land and Facilities Planning Processes and Programs.

ARMY

NAVY

AIR FORCE

MARINE CORPS

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Forward

Four years ago, my colleagues and I at Rocky Mountain Institute's Green Development Services agreed to help the Naval Facilities Engineering Command (NAVFAC) to make highly integrated, sustainable design its standard practice. We scarcely dared hope then for the sort of revolution that NAVFAC's leadership has since launched—consolidating long-standing pieces of specialized work in the other services, *e.g.* at the Army's CERL, into broad new ways of thinking and acting in design, construction, and operation of diverse facilities by all services around the world. Now those efforts, originally focused on building design, are integrating back upstream into land planning.

Sustainable Planning: A Multi-Service Assessment 1999 offers planning professionals an important, welcome, and timely next step in this new practice. It lucidly outlines the rationale, scope, and content of the services' shared opportunities to do more and better with less; to make military facilities not a cause of harm to their surroundings but a tool for their restoration and betterment; and to provide the proper planning context for ensuring that the best technologies and design methods are so combined as to yield better human, environmental, resource, *and* financial performance, simultaneously and without compromise. Much of the art of turning trade-offs into synergies comes later, in the details of architecture and engineering; but to avoid lost opportunities and complications, those design arts must rest initially on sound planning.

The immediate, obvious, and powerful motivations for sustainable planning and design are to stretch budgets, fulfill environmental responsibilities, support operational effectiveness, and improve the quality of military life. However, sustainable planning provides far deeper benefits for the mission of the Department of Defense (DoD):

- It sets a properly high standard for the rest of the federal government and for the private sector, both in concept and in subsequent execution. Indeed, I have had occasion to cite our experience with NAVFAC to corporate CEOs as an example of the important difference between leadership and management: both military and civilian personnel, led by ADM Joe Lopez, who chaired the Resources Requirements Review Board back in 1995 when I first became associated with DoD, Cheryl Kandaras, Principal Deputy Assistant Secretary of the Navy, and NAVFAC Chief Architect, Terrel Emmons, FAIA, all of whom exhibited impressive initiative, boldness, and persistence in overcoming obstacles.

- It supports the design of military facilities that are resilient and largely or wholly self-reliant, thus reducing vulnerability, support logistics, costs, and pollution.

- It helps lay the conceptual and practical foundations for using America's energy, water, materials, land, and other resources in ways that save money. Ultimately this can free up at least $2 trillion a year to devote to other social needs more pressing than pure waste.*

- It helps to educate the design professions in integrated practices and design mentalities that can better meet all customer requirements. Integration with the local community can result in shared efficiencies and improved planning practices.

- It trains personnel who may later apply their valuable sustainability skills to civilian needs, just as many of America's specialists in direct digital controls for buildings got their initial training in the Navy.

- It stimulates the private sector to provide environmentally sound and resource-efficient technologies and services with greater variety, quality, quantity, and cost-effectiveness.

- It is likely to encourage the development of new technologies with important civilian spin-off benefits. That's one of the main reasons I'm serving on a new Defense Science Board panel examining ways to improve the energy efficiency of all military platforms (land, sea, and air)—an effort partly inspired by NAVFAC's success with efficient buildings.

- It may develop new institutional mechanisms that improve the efficiency and sustainability of the entire economy. For example, I hope the services will lead DoD, and ultimately the whole federal government, to base procurement of design services on recent RMI-led experiments in "performance-based fees," which reward design professionals for measured energy and resource savings and not for capital expenditures.

- It fulfills the military duty to help abate, by action and example, such threats to environmental security as climate change, and fosters the fair and durable global development patterns that are prerequisites for a sound economy and a peaceful world.

- In particular, sustainable planning promotes the wide practice of advanced resource productivity that can profitably reduce conflict. Many conflicts are about, or exacerbated by, perceived shortages of inequitable distributions of resources ranging from oil to water and from cobalt to cod. Using resources far more efficiently can create abundance, or at least adequacy, for all and can thereby help to defuse tension. (For example, a new generation of superefficient light vehicles, described at <www.hypercarcenter.org>, can ultimately save as much oil as OPEC now sells, helping to turn "Mission Impossible" into "Mission Unnecessary" in the Persian Gulf. Like negawatts (saved electricity), nega-missions tend to work better and cost less than wars.) Preventing conflict is generally cheaper and easier than resolving it peacefully, which in turn is generally cheaper and easier than resolving it militarily. Everyone will be safer and feel safer, and military professionals will be less often put in harm's way to protect key national interests, if we all strive to turn wasted resources and degraded environments into profits and peace.

- Removing any perceived inconsistency between the day-to-day work which military personnel do and the ideals for which they have chosen to serve—the values they cherish for their families and communities—creates a remarkable outpouring of energy, initiative, and enthusiasm. This can revitalize personal careers, unit morale, and the effectiveness of the entire military establishment by leading the nation toward sustainability and true security.

The dictionary defines security as, "freedom from fear of privation or attack." Sustainable planning is an important foundation for both these aspects of security. I commend this report to the widest possible readership of planning and design professionals, both military and civilian, as a guide and inspiration to using planning as a tool to build real security for us and our descendents, not from the top down but from the bottom up, and not at a cost but at a profit.

— Amory B. Lovins
Co-Chief Executive Officer (Research)
Rocky Mountain Institute (<www.rmi.org>)
Old Snowmass, Colorado
4 August 1999

* Many of these opportunities are more fully described in the 30 September 1999 book *Natural Capitalism: Creating the Next Industrial Revolution* (P. Hawken and A.& H. Lovins, Little Brown, New York), summarized in a May–June 1999 Harvard Business Review article on the world wide web at <www.rmi.org/HBR-RMINatCap.pdf>.

To speak of sustainability is to discuss ecology. Ecology provides the principles with which to work.

Sustainable development begins by accepting that everything we have to build with is already here.

If growth cannot occur without destroying what the natural world has provided, or it can not be safely returned to nature after its use; another choice simply must be made.

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Executive Summary

Executive Summary

Protecting the values of our society is the unique charge of the Department of Defense (DoD). It is the sole institution responsible for protecting national values and defending the nation's way of life from outside intrusions. Because of these responsibilities, sustainability demands the attention of the DoD on several levels. In a very basic sense, sustainability is a vital national security concern. The health and welfare of our population, and the global population, depends upon the quality of the environment and the availability of resources. In addition, the United States military services have been at the cutting edge of technical, medical, social, educational, and cultural advancements throughout history. Also, by virtue of their authority structure, system of accountability, task orientation, intellectual capacity, resources, geographic dispersal, and desire to succeed, they have an excellent opportunity for leading the nation by example. The DoD has become an enormous enterprise. It is simultaneously global in scale and local in impact and influence. It operates ocean ports, airports, and factories. It builds communities with elementary schools, child care centers, grocery stores, recreation centers, and hospitals. The impact and influence the DoD has on the built environment is substantial.

> "In our every deliberation, we shall consider the impacts of our decision upon the next seven generations"
>
> - Law of the Iroquois Confederacy

The *Feasibility Study for Implementing Sustainable Development Concepts and Principles into the Army, Navy, Air Force, and Marine Corps Land and Facilities Planning Processes and Programs* or **Sustainable Planning: A Multi-Service Assessment 1999**, is sponsored by the Office of the Secretary of Defense and is the first service-wide attempt by the DoD to address sustainability and sustainable planning at a policy level. The purpose of the Feasibility Study is to establish a common understanding of sustainable development that can be applied to planning, and to use that understanding to assess opportunities to include sustainability in military planning. Definitions of sustainability, sustainable development, and sustainable planning communicate a value system that is both universal and complicated. The challenge of this effort was to find common ground among a diverse group of stakeholders who will eventually practice sustainable planning. A key issue for the DoD and the individual services is the practical application of sustainability within the unique culture of the military. While the basic truths underlying the concepts and

principles of sustainability remain constant, their application must be tailored in a way that can be understood and then implemented. Addressing this challenge is an important goal of the Feasibility Study.

This study is only a beginning. As a multi-service effort, the Feasibility Study focuses on overarching issues and opportunities. It will be the responsibility of the DoD and the individual services to chart a course of action with practical approaches that will capitalize on some of these opportunities. Only then can the military services fully implement sustainable planning and make it the way business is done.

Sustainable Development

In its most basic sense sustainability means "lasting." To be sustainable is to function in a manner that can be perpetuated, continued, or maintained. Sustainability is a concept that recognizes human civilization as an integral part of the natural world. It also recognizes that nature must be preserved and perpetuated if the human community is to sustain itself indefinitely. By subscribing to the fundamental concepts of sustainability and applying them to every aspect of human existence, improvements can be made to the current environment that will ensure a life-giving and healthful world for future generations.

The philosophy of sustainability pervades human systems as an organizing concept. Often discussed are the ideals of a "sustainable" government that protects political freedom, or a "sustainable" society that is tied to issues of social, cultural, and spiritual equity, or even a "sustainable" economy that provides basic human needs and economic prosperity. Likewise, "sustainable" development is a physical manifestation of development that is compatible with nature. It satisfies human needs and desires for physical development, while maintaining a balance with natural systems that are limited in their ability to accommodate that development. While sustainability concentrates on the relationship between nature and humanity, the concept of sustainable development (see Figure E.1) focuses on the connections between natural systems and human development in the physical environment. The premise of sustainable development challenges

Our vision is of a life-sustaining Earth. We are committed to the achievement of a dignified, peaceful, and equitable existence. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends.

- President's Council on Sustainable Development

the common notion that the natural and built environments function in opposition. It strives to create balance and harmony between the natural and built worlds to ensure the long-term survival of both. Sustainable development integrates development into the natural context without limiting nature's ability to sustain life.

Figure E.1

Concept of Sustainable Development

Earth, across all scales, is comprised of interconnected, life giving ecosystems that include Nature and Humanity. There are limits to Nature and its ability to sustain life.

In the relationship between Nature and Humanity, Sustainability – a balanced relationship between natural and human systems–dictates the need for sustainable development.

Sustainable Development achieves harmony between human development and natural systems by efficiently using existing built environments and integrating new development with the natural context. Sustainable Development strives for no net loss to Nature.

"We have to stop and think about the decisions we make in our individual lives and in our societies. We tend to be very shortsighted, driven by short-term gains. Somehow we've got to recognize that the environment is the center of our lives; it is not a marginal issue."

- Stuart Pimm, Conservation Biologist

Principles are a popular way to express commitment to certain ideals and to provide objectivity for a broader concept. Closely examining the concept of sustainable development has lead to a number of basic truths or principles. The Feasibility Study based its assessment of military planning policies and practices, in part, upon the principles of sustainable development which reflect the fundamental or core values of sustainability (see Figure E.2). These principles are visionary; they act as a touchstone for all who may be involved in development, including planners, designers, and engineers.

When one blends the broad concepts of sustainability and the more definitive principles of sustainable development with the established practices of planning, the result is sustainable planning. Sustainable planning employs the principles of sustainable development as the standard against which to evaluate all strategies and actions. It implies a search for creative ways to accomplish change. It also suggests that policies, programs, processes, and practices are integrated across disciplines and across levels of authority. As a professional practice, planning supports decision-making. Sustainable planning seeks creative ways to interject the values and principles of sustainable development into the decision-making process. With planning so heavily influenced by process, it was helpful in this Feasibility Study to further codify sustainable development into the principles of sustainable planning (see Figure E.3).

Figure E.2

Principles of Sustainable Development

- Natural systems have a right to coexist with human development.
- At all scales, the natural context shall be emphasized in human development.
- Human development and experience are enhanced by the natural world.
- Natural resources are finite and human development shall not deplete nor degrade these resources.
- When the built environment reflects culture, heritage is perpetuated.
- Communities shall foster opportunities for civic engagement and personal interaction in vibrant public spaces.
- Benefits are realized when development solutions are sought within the existing built environment.
- Technology, science, engineering, planning, and design shall be used to create efficient and long-lasting development.
- Nature cannot be controlled or evaded; therefore, it is the ultimate regulator of human development.

Planning Areas Explored:

- *land and facilities*
- *environment*
- *cultural resources*
- *natural resources*
- *transportation*
- *circulation*
- *utilities*
- *quality of life*
- *environmental justice*

Sustainable planning acknowledges the importance of the principles of sustainable development when making decisions and endeavors to advance balance and harmony within the context of both natural and built environments. Sustainable planning also recognizes that sustainable development may not be fully attainable, but that every effort should be made to incorporate its values in each planning consideration and decision.

Figure E.3

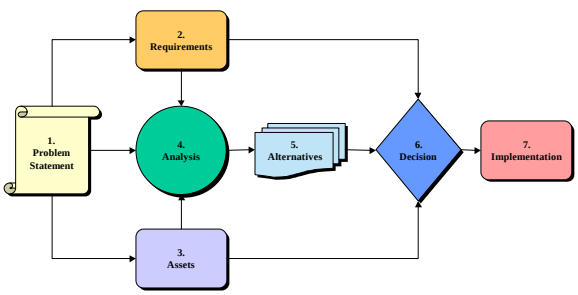
Principles of Sustainable Planning

- Strive to enhance the relationship between the natural and built environments.
- Establish the natural context as the framework for the built environment.
- Endeavor to incorporate human development into the natural context at all scales.
- Advocate for the acceptance of sustainability as a value system across all levels of authority.
- In all decisions, reconfirm the relationship of nature to the built environment.
- Use the continuous and iterative character of the planning process to interject values of sustainable development.

Military Planning

Military planning supports military missions by managing the land and facilities entrusted to each military service to ensure that the necessary infrastructure is in place to accommodate specific missions. As the 21st Century approaches, it is apparent that military planning has undergone change. Declines in force structure, decreasing budgets, and fewer resources have placed new pressures on military planning and have influenced the business practice of planning. In the past, military planning envisioned long-term growth. In the new fast-paced, budget-

General Military Planning Process



conscious climate of today, long-term planning is irresolute. These changes have forced each service to rethink its planning policies and practices. Planning is becoming a more responsive, dynamic, strategic process that supports real-time decision making. The Feasibility Study identifies further opportunities for planning to meet the challenges of the new Century. It investigates three distinct areas of planning, including:

- Policy
- Process
- Practice

Policy Assessment

The DoD and its services – Army, Navy, Air Force and Marine Corps – operate in accordance with Federal legislation. As a Federal agency, the DoD is charged with developing a strategy for implementation and compliance to policy mandates. These strategies, called Directives, often guide the services in developing their own instructions to fulfill policy objectives. These instructions provide varying levels of guidance and focus on more detailed matters of implementation. The Policy Assessment provides insight into military planning practice by analyzing the policies that guide that practice. Policies that govern the targeted planning component areas were identified and examined in the initial phase of this assessment. Policy "chains" were created by tracing the origins of the instructions that are used by planning, design, and engineering practitioners. These policy chains linked the more detailed instructions to the applicable DoD policy, and to the originating Federal legislation or Executive Order. By looking at the entire body of policy, a broad, across-the-service assessment of policy issues could be performed (see Figure E.4).

Process & Practice Assessment

The purpose of the Process and Practice Assessment is to determine the extent to which the principles of sustainable development currently are applied within military planning and to identify additional areas where these principles may be applied in the future. This assessment is presented in eleven individual issues that apply to all of the military services (see Figure E.5). The issues and supporting arguments were generated through a process of evaluation and assessment that included five key steps. Two of these steps evaluated the

policy issues

Figure E.4

Policy Assessment Issues

Issue 1: **The existing multi-tiered policy structure that supports planning is cumbersome and, at times, fragmented.**

Issue 2: **Achieving policy objectives is often impeded because of the prescriptive assignment of roles and responsibilities in planning policies.**

Issue 3: **Differences in scope, procedure, and legal effect create obstacles for effectively integrating planning and environmental policies and instructions.**

Issue 4: **Current planning policies tend to limit the planning perspective to those assets found within the installation boundary; they do not strongly support planning with a regional perspective.**

Issue 5: **Current planning policies often support a planning process that assumes project-oriented solutions.**

Issue 6: **Sustainable planning would be most successful if it were supported by a high-level mandate that is clear, concise, and consequential.**

process & practice issues

Figure E.5

Process and Practice Assessment Issues

Issue 1: Sustainable planning seeks to enhance existing military planning processes and practices.

Issue 2: Sustainable planning encourages a holistic, multi-disciplinary, and intra-organizational approach to address real property issues.

Issue 3: Sustainable planning will be most successful when it is tied to the operations mission of an installation through common objectives and shared values.

Issue 4: Sustainable planning encourages partnerships between planning and environmental organizations to effectively achieve common goals and objectives.

Issue 5: Sustainable development will be most successful where understanding and cooperation between military and civilian communities are maximized.

Issue 6: Building upon sound planning practices that already exist can ensure a smooth transition to sustainable planning.

Issue 7: Sustainable planning places value on open space and strives to integrate natural and built environments.

Issue 8: Sustainable planning would be most successful if complete, accurate, timely, quantitative and qualitative asset data were available for both built and natural inventories at all times.

Issue 9: Sustainable planning has great potential to provide a positive return-on-investment to the mission it supports.

Issue 10: True cost accounting, which includes complete first and life-cycle costs of development, can support the value of sustainable planning and development.

Issue 11: Sustainable planning supports improvements to the financing of both planning and program implementation.

business practices of planning and two steps evaluated and assessed the *process methodology* of planning. The final step summarized the evaluations into eleven issues with supporting arguments.

Opportunities

The primary purpose of the Feasibility Study is to identify opportunities to enhance, supplement, or expand military planning through the principles of sustainable development. The opportunities presented in this section spring from an examination of planning policy, process and practice. Each of these areas has been evaluated and assessed with great respect for planning and realizing that planning is essential to the overall military mission.

The opportunities for sustainable planning are in education, policy, funding, partnership, mission, practice, process, stewardship, nature, control and costing (see Figure E.6). They can effectively transition planning in each service into a more holistic, strategic, and effective type of planning. However, the opportunity areas and supporting details identified here are not *solutions*. It will be the responsibility of the military services to individually or collectively develop action plans to seize these *opportunities* and implement change. If these changes are made, sustainable planning will provide lasting value to the mission it supports and the global environment at-large.

opportunities

Figure E.6

Sustainable Planning Opportunities

EDUCATION:	**Educate and train military leadership, management, and service personnel about sustainable development values.**
POLICY:	**Prepare a policy mandate establishing a sustainable development initiative that includes an education program, sustainable planning, and an indicators program.**
FUNDING:	**Modify organizational and program funding to support sustainable planning.**
PARTNERSHIP:	**Support sustainable planning through strategic partnerships.**
MISSION:	**Incorporate sustainability in all decisions to make planning more relevant to the operational mission.**
PRACTICE:	**Broaden the scope of planning to include component organizations that adhere to the same sustainable planning principles.**
PROCESS:	**Fully integrate sustainable development into the process methodology of planning.**
STEWARDSHIP:	**Ensure that sustainable use of public lands, including a sustainable relationship with surrounding communities and larger natural systems, is part of military stewardship.**
NATURE:	**Recognize the value of natural open space as essential to sustainable development in all land uses.**
CONTROL:	**Formalize a sustainable planning statute to provide a sustainable basis for mission decisions, planning proposals, and as a long term control on development.**
COSTING:	**Use full and true cost accounting procedures to show the value of sustainable planning and development.**

"This Feasibility Study will support the Army, Air Force, Navy, and Marine Corps in evaluating their land and facilities planning policies, processes, functions, and methodologies and will identify the necessary opportunities to assimilate and fully integrate sustainab[ility] concepts and principles into planning."

- Statement of Services

Conclusion

Planning within the military services is quite different today than it was just a decade ago. Changes in force structure, budgets and resources have made both slight modifications and major changes necessary to keep planning current, relevant, and viable. Some of these changes have already taken place. The military services have developed a better understanding of the importance of complete asset inventories, the need for top performance in environmental programs, and the demand for mission sustainability. This atmosphere of change provides yet further opportunities to create a better future for military installations with sustainable development. Changes in planning can increase the overall quality of life for those who live and work in the military community and can build a better future on the lessons learned from the past.

One of the first tasks of a sustainable development initiative in the military is to establish policies that effectively guide change. Sustainable planning can incorporate and enhance many of the instructions now used to support of real property planning. This new sustainable policy umbrella could establish common sustainable development goals and objectives, permit regions or installations to assign responsibilities and allocate resources necessary to meet objectives, and implement a planning system that is integrated both horizontally and vertically to ensure that all relevant organizations and individuals participate.

Sustainable planning also creates an opportunity to improve planning by shifting the focus of military planning from growth-based, project analysis, and decision-making methods to new methodologies resulting in sustainable solutions and strategies that support mission needs. These changes must begin by incorporating sustainable development principles as a value system throughout the planning process; making it more inclusive, dynamic and responsive. By making planning more strategic, sustainable planning can provide flexibility for planners and stakeholders to respond to a continuously changing environment with new strategies that focus on effective and efficient implementation.

Sustainable planning in the 21st Century will be holistic, fair, responsible, comprehensive and strategic. The Department of Defense and each military service can greatly enhance the sustainability of their missions and their communities through the opportunities of sustainable planning.

Notes

Introduction

"In our every deliberation, we shall consider the impacts of our decision upon the next seven generations"

- Law of the Iroquois Confederacy

Introduction

Sustainability is a philosophy that has existed for generations. Native American populations lived in great harmony with nature, and the balanced relationship they maintained with the land exemplifies sustainability in its most basic form. Entrenched in their culture was not only respect for the land, but the understanding that in order for their civilizations to survive, the land must support future generations.

> The earth belongs to each... generation during its course, fully and in its own right, no generation can contract debts greater than may be paid during the course of its own existence."
>
> - Thomas Jefferson

Like the native populations before them, our nation's founding fathers embraced the ideals of sustainability. Those immersed in the agricultural economy upheld the agrarian ethic and viewed themselves as stewards of the land. The ideas of stewardship were reflected in the writings of Thomas Jefferson, who in 1789 wrote, "the earth belongs to each…generation during its course, fully and in its own right, no generation can contract debts greater than may be paid during the course of its own existence."

Since the time of Jefferson, the United States has developed into one of the largest and most powerful nations in the world. Over the course of two centuries, this nation has been transformed from an agrarian to an urban society. The stewardship ethic so strongly embraced by people like Jefferson must continue to ensure the sustainability of our society and way of life for generations to come.

Protecting the values of our society is the unique charge of the Department of Defense (DoD). It is the sole institution responsible for protecting national values and defending the nation's way of life from outside intrusions. Because of these responsibilities, sustainability demands the attention of the DoD on several levels.

"We have to stop and think about the decisions we make in our individual lives and in our societies. We tend to be very shortsighted, driven by short-term gains. Somehow we've got to recognize that the environment is the center of our lives; it is not a marginal issue."

- Stuart Pimm, Conservation Biologist

Sustainability and National Security

In a very basic sense, sustainability is a vital national security concern. The health and welfare of our population, and the global population, depends upon the quality of the environment and the availability of resources. Problems are arising across the globe because society's members are consuming large quantities of natural resources. Military forces themselves will continue to depend upon increasingly scarce resources. Each time natural resources are used, it reduces the potential to meet tomorrow's needs. Conflicts over access to natural resources are igniting across the globe. The struggles for water rights and oil resources have brought nations to odds. In the interest of national security, the DoD should involve itself in Sustainability.

Sustainability and National Defense

The United States military forces have been at the cutting edge of technical, medical, social, educational, and cultural advancements throughout history. The military forces, by virtue of their authority structure, system of accountability, task orientation, intellectual capacity, resources, geographic dispersal, and desire to succeed, have an excellent opportunity for leading the nation by example. Sustainability is a value system; therefore, when the military protects and defends our country's values and way of life, they are essentially defending sustainability. Sustainability can clearly alter the path of national defense from protecting the nation despite the costs to the environment, to protecting the values of the nation while preserving the health of our natural environment.

An installation is an integral part of the ecological, economic, social, and political systems within the geographic area in which it is located.

> We must take bold and unequivocal action: we must make the rescue of the environment the central organizing principle for civilization... we are now engaged in an epic battle to right the balance of our earth; the tide of this battle will turn only when the majority of the people become sufficiently aroused by a shared sense of urgent danger to join an all-out effort. It is time to come to terms with exactly how this can be accomplished.
>
> - Al Gore
> Vice President of the United States

Sustainability and Stewardship

The DoD, through its services, is granted an extensive amount of land and uses vast infrastructure to accomplish mission objectives. In doing so, the DoD has become an enormous enterprise. Its budget represents more than 15 percent of total Federal expenditures and 3 percent of the national gross domestic product. Its installations touch the economies and environments of every state and of many countries around the world. The DoD consumes four times as much energy as the rest of the federal government combined. It is simultaneously global in scale and local in impact and influence. It operates ocean ports, airports, and factories. It builds communities with elementary schools, childcare centers, grocery stores, recreation centers, and hospitals. The impact and influence the DoD has on the built environment is substantial.

The services have a responsibility to the citizens of the nation to be stewards of the public land granted to them. While current planning policies and programs in all of the services perform in a creditable manner with respect to environmental issues, there are substantial improvements that could be realized through sustainable planning. By focusing on sustainable planning, the DoD can be a true steward of the land it occupies.

Study Purpose and Goals

Sustainable Planning : A Multi-Service Assessment 1999 is the *Feasibility Study for Implementing Sustainable Development Concepts and Principles into the Army, Navy, Air Force, and Marine Corps Land and Facilities Planning Processes and Programs.* It is herein referred to as the *Feasibility Study*. The Feasibility Study is sponsored by the Office of the Secretary of Defense and is the first service-wide attempt by the DoD to address sustainability and, specifically, sustainable planning at a policy level. The purpose of the Feasibility Study is to seek opportunities within the military services to become more sustainable by focusing on sustainable planning through re-engineering current business practices and improving the relationship between the built and natural environments.

Definitions of sustainability, sustainable development, and sustainable planning communicate a value system that is both universal and complicated. Obstacles arise when attempting to communicate ideas without first establishing a universal language and a common understanding. In order for open dialogue to occur, overarching concepts must be filtered, focused and then communicated. Only then can the ties from sustainability to planning and development be understood.

Above all else, the goal of this effort is to establish a common understanding of sustainable development that can be applied to planning, and to use that understanding to assess opportunities for its inclusion in the practice of military planning.

The challenge of this effort was to find common ground among a diverse group of stakeholders who will eventually practice sustainable planning. A key issue for the DoD and the individual services is the practical application of sustainability within the unique culture of the military. While the basic truths underlying the concepts and principles of sustainability remain constant, their application must be tailored in a way that can be understood and then implemented through the functional systems of the military. Addressing this challenge is an important goal of the Feasibility Study.

This study is only a beginning. The opportunities identified for assimilating sustainable development principles into military planning are far-reaching and can lead to major changes. As a multi-service effort, the Feasibility Study focuses on overarching issues and opportunities. It is the responsibility of the DoD and the individual services to chart a course of action with practical approaches to capitalize on some of these opportunities. Only then can the military services fully implement sustainable planning and make it the way business is done.

History of Sustainable Development

Our vision is of a life-sustaining Earth. We are committed to the achievement of a dignified, peaceful, and equitable existence. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends.

- President's Council on Sustainable Development

Sustainability and sustainable development emerged as mainstream topics in 1987 with the publication of a report by the United Nation's World Commission on Environment and Development titled, *Our Common Future*. The Brundtland Commission (named for the Commission Chair, Norwegian Prime Minister Gro Harlem Brundtland) was the first major international effort to introduce the concept of sustainable development into the mainstream of political thought. The legacy of the Brundtland Commission is that it provided the first widely held definition for sustainable development.

> Sustainable Development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
>
> - The Brundtland Commission

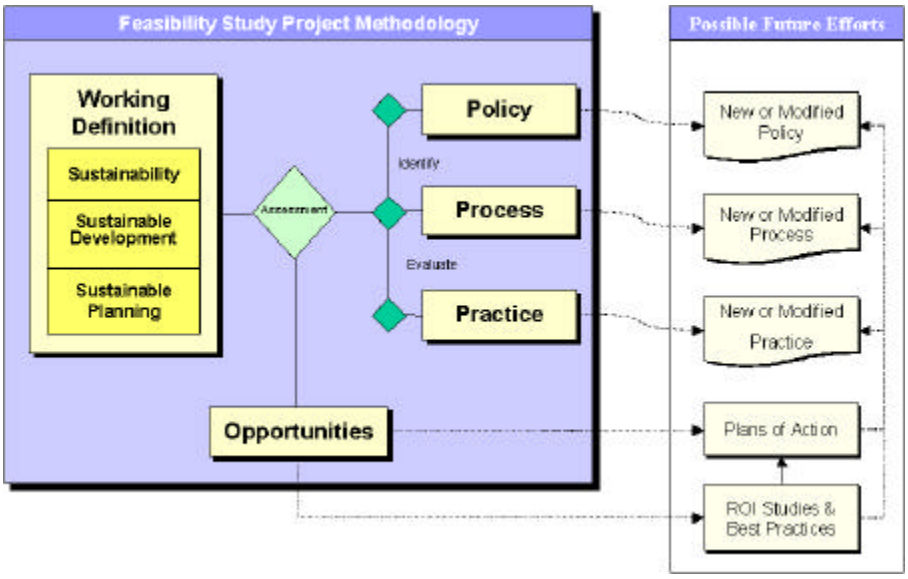
Spurred by the enthusiastic reception of Our Common Future, leaders from nearly 100 countries around the globe convened in Rio de Janeiro in June of 1992 for what is commonly known as the Earth Summit. Collectively, this group began to discuss and develop solutions for global environmental problems. The results of this effort were compiled in a publication commonly known as *Agenda 21*, a worldwide plan that is widely recognized as the blueprint for achieving global sustainability. Agenda 21 challenges the world "to halt and reverse the environmental damage to our planet and to promote environmentally sound and sustainable development in all countries on earth."

International attention to global environmental issues triggered a series of actions by the United States government to address the emerging issue of sustainable development. President Clinton formally advanced a sustainable development agenda in 1993 by issuing Executive Order 12852 that established the President's Council on Sustainable Development (PCSD). Three years after its inception, the PCSD published *Sustainable America: A New Consensus*, adopting the Brundtland Commission's definition for sustainable development and supporting sustainability by creating a vision statement for a "sustainable United States." To implement this vision, the PCSD developed a series of goals for a sustainable America that reflect a national perspective on the interrelationships between social, economic, and environmental issues.

Issues related to sustainable development remain on the national agenda. In January of 1999, Vice President Al Gore announced the "Clinton-Gore Livable Agenda: Building Livable Communities for the 21st Century," that challenges local authorities to plan and build better.

This Feasibility Study is intended to support the DoD and the individual services—Army, Navy, Air Force, and Marine Corps—in evaluating the existing land and facilities planning policies, processes, functions, and methodologies. The purpose of the study is to identify key opportunities for assimilating sustainable planning into the military services. The following methodology, established for this study, includes four key tasks.

Figure 1
Project Methodology



TASK 1: **Establish a "working definition" for sustainability, sustainable development, and sustainable planning.**

The first task of this study was to establish a "working definition" of sustainable planning that is founded upon the basic and accepted truths of sustainability, the value system of sustainable development, and the unique culture of the military. This definition summarizes the concept and outlines the principles of sustainable development. To add further detail to the working definition, principles of sustainable planning were also developed. These principles, tailored to the unique structure of military planning, incorporate ideals of sustainability into general planning concepts.

Methodology

"This Feasibility Study will support the Army, Air Force, Navy, and Marine Corps in evaluating their land and facilities planning policies, processes, functions, and methodologies and will identify the necessary opportunities to assimilate and fully integrate sustainab[ility] concepts and principles into planning."

- Statement of Services

TASK 2: Assess Planning Policy

Armed with an understanding of sustainability, sustainable development, and a working definition of sustainable planning, Task 2 set out to assess existing policies and instructions that guide and support real property planning in each service. The first effort in this task was to identify the key policies and instructions used to support planning. The second effort then evaluated where sustainable development is addressed and where existing policy or instruction supports actions contrary to the principles defined in Task 1.

TASK 3: Assess Planning Process and Practice

The planning process and practice assessment began with a series of interview workshops conducted with representatives of each service. The purpose of these workshops was to gauge the current state of military planning practice. Workshop participants represented a cross-section of rank and authority, a broad range of disciplines, and a number of organizations. Each service also participated in a critical assessment exercise to evaluate and compare their current business process to the working definition of sustainable planning. The outcomes of the workshops and exercises were then further assessed into service-wide planning issues.

TASK 4: Identify Opportunities

Task 4 identified sustainable planning opportunities for both the DoD and the individual services based on the issues found in Tasks 2 and 3. These issues were summarized, synthesized, and reviewed. The policy, process and practice issues were found to be very similar across the individual services.

TASK 5: Possible Future Efforts (not part of the Feasibility Study)

- New or modified Policies
- New or modified Instructions
- New or modified Processes
- New or modified Practices
- Plans of Action
- Return-On-Investment (ROI) Studies
- Best Practice Studies

Planning Areas Explored:

- *land and facilities*
- *environment*
- *cultural resources*
- *natural resources*
- *transportation*
- *circulation*
- *utilities*
- *quality of life*
- *environmental justice*

Assumptions & Deletions

This is a general overview of service-wide issues and opportunities.

This effort is the first step taken by the DoD to address sustainable planning at a policy level. It takes a very broad view of the subject.

This is not a service-specific assessment.

This effort is sponsored by the DoD. The report is intended to be an overview document for all services that discusses common issues and opportunities revealed during the assessment. With few exceptions, the issues are similar if not identical across the services.

This is not door-to-door directions but a road map with different paths.

The effort is focused on opportunities. There are numerous opportunities for sustainable development in planning and still more solutions or actions that could further sustainable planning goals. This study offers potential steps or actions that may lead to sustainable development through planning, but it is not a "how to" manual.

This is not the final word, it is only the beginning.

This effort is intended to start the DoD and the individual services thinking about what can be done today and in the future to practice sustainable planning. The Feasibility Study is the spark to ignite further action.

Sustainable Development

SUSTAINABILITY

- *Generational Responsibility*
- *Interconnectivity*
- *Ecological Integrity*
- *Quality of Life*
- *Social Equity*
- *Cultural Diversity*
- *Spirituality*
- *Economic Prosperity*
- *Political Freedom*

Sustainability

In its most basic sense sustainability means "lasting." To be sustainable is to function in a manner that can be perpetuated, continued, or maintained. Currently, the balance between the human community and the ability of nature to sustain life by consumerism and environmental degradation. Examples of environmental destruction, economic inequity, and societal unrest are found around the globe. As society endeavors to turn the tide and restore a harmonious balance between humanity and nature on this earth, sustainability presents a new ideal.

Sustainability is a concept that sees human civilization as an integral part of the natural world. It recognizes that nature must be preserved and perpetuated if the human community is to sustain itself indefinitely. By subscribing to the fundamental concepts of sustainability and applying them to every and all aspects of human existence, improvements can be made to the existing condition that will ensure a life-giving and healthful world for future generations.

To understand the relationship between nature and humanity in the context of sustainability, it is important to first look at nature and humanity separately. Nature is defined as the sum of the world's natural systems. Humanity can be thought of as the combined qualities of human values, interests, and potentials expressed in government, society, economy, and development. While societies, governments and economies are human systems created by people, development

Global Indicators of UNSUSTAINABILITY

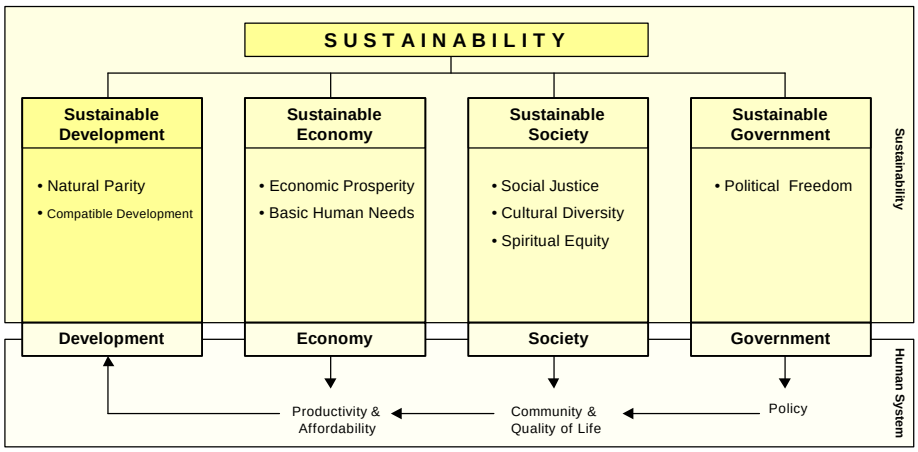
- *Global Warming*
- *Soil Degradation*
- *Deforestation*
- *Species Extinction*
- *Consumption*
- *Population Growth*
- *Inequitable Distribution of Resources*
- *Dependence on Non-Renewable Resources*
- *Pollution*
- *Environmentally Destructive Development*

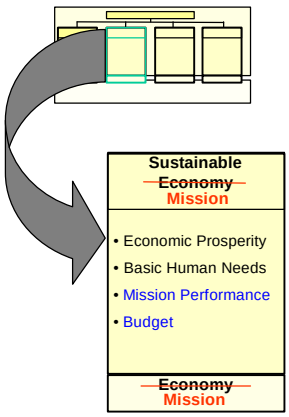
is the product of these systems. Societies, governments, and economies greatly influence physical development through culture, quality of life, communities, policies, and measures of productivity.

The philosophy of sustainability pervades human systems as an organizing concept. Often discussed are the ideals of a "sustainable" government that protects political freedom, or a "sustainable" society that is tied to issues of the social, cultural, and spiritual equity, or a "sustainable" economy that provides basic human needs and economic prosperity (see Figure 2). Likewise, "sustainable" development is a physical manifestation of development that is compatible with nature. It satisfies human needs and desires for physical development, while maintaining a balance with natural systems that have limits to their ability to accommodate that development.

While sustainability concentrates on the relationship between nature and humanity, the concept of sustainable development (see Figure 3) focuses on the connections between natural systems and human development in the physical environment. The premise of sustainable development challenges the common

Figure 2
Hierarchy of Understanding





Mission = Economy:
The military mission is the guiding system of management and service in the DoD much like the economy is the guiding system of production and services in the private sector. Based on this understanding of the military, mission could replace economy in Figure 2 along with the addition of mission performance and budget ideals, and affordability as an influence of a "sustainable" mission on sustainable development.

The Influences of Sustainable Development Across all Scales.

A building impacts the site, several sites impact a location, many locations impact a region, and regions collectively, have global implications.

notion that the natural and built environments function in opposition. It strives to create balance and harmony between the natural and built worlds to ensure the long-term survival of both. Sustainable development integrates development into the natural context without limiting nature's ability to sustain life.

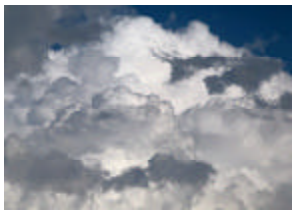
Figure 3
Concept of Sustainable Development

Earth, across all scales, is comprised of interconnected, life giving ecosystems that include Nature and Humanity. There are limits to Nature and its ability to sustain life.

In the relationship between Nature and Humanity, Sustainability – a balanced relationship between natural and human systems–dictates the need for sustainable development.

Sustainable Development achieves harmony between human development and natural systems by efficiently using existing built environments and integrating new development with the natural context. Sustainable Development strives for no net loss to Nature.

Sustainable Development



Principles are a popular way to express commitment to certain ideals and to provide objectivity for a broader concept. Closely examining the concept of sustainable development has lead to a number of basic truths or principles. These principles are visionary; they act as a touchstone for all who may be involved in development, including planners, designers, and engineers. Sustainable development principles can help guide business policies, processes, and practices.

The Feasibility Study based its assessment of military planning policies and practices, in part, upon the principles of sustainable development (see Figure 4) which reflect the fundamental or core values of sustainability.

The principles of sustainable development require an acceptance of new values that will result in less consumptive and destructive development decisions. These principles strengthen the belief that planning and design can result in development that coexists with nature. This is accomplished when planning and design proceed with an understanding of the natural context of local, regional, and global environments. The principles of sustainable development emphasize natural context and suggest that nature can actually improve development. The principles also help to underscore the importance of heritage and culture in development to foster civic engagement and increase the vibrancy of communities.

Finally, by focusing attention on the potential that lies within existing built environments, sustainable development can provide unrealized benefits and increase the efficiency and longevity of infrastructure already in place.

Figure 4

Principles of Sustainable Development

- Natural systems have a right to coexist with human development.
- At all scales, the natural context shall be emphasized in human development.
- Human development and experience are enhanced by the natural world.
- Natural resources are finite and human development shall not deplete nor degrade these resources.
- When the built environment reflects culture, heritage is perpetuated.
- Communities shall foster opportunities for civic engagement and personal interaction in vibrant public spaces.
- Benefits are realized when development solutions are sought within the existing built environment.
- Technology, science, engineering, planning, and design shall be used to create efficient and long-lasting development.
- Nature cannot be controlled or evaded; therefore, it is the ultimate regulator of human development.

The purpose of planning, in a general sense, is to have a predictable course of action to guide all efforts. Planning eliminates uncertainty, defines common objectives, and strives to chart a course for all to follow. Planning as a professional practice recognizes the need to involve many players and many disciplines in charting this course of action. Because sustainability is an organizing concept that champions a holistic and inclusive approach, it is clear that planning has a key role in the quest for sustainability.

When one blends the broad concepts of sustainability and the more definitive principles of sustainable development with the established practices of planning, the result is sustainable planning. Sustainable planning is planning that, through policy and practice, focuses on achieving a balanced relationship within the built environment between natural and human systems.

Sustainable planning employs the principles of sustainable development as the standard against which to evaluate all strategies and actions. It implies a search for creative ways to accomplish change. It also suggests that policies, programs, processes, and practices are integrated across disciplines and across levels of authority.

As a professional practice, planning supports decision-making. Sustainable planning seeks creative ways to interject the values and principles of sustainable development into the decision-making process.

With planning so heavily influenced by process, it is helpful to further codify the concept and principles of sustainable development into principles of sustainable planning (see Figure 5).

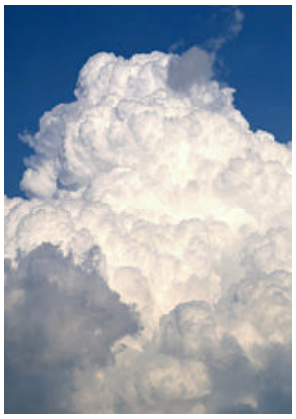
Figure 5

Principles of Sustainable Planning

- Strive to enhance the relationship between the natural and built environments.
- Establish the natural context as the framework for the built environment.
- Endeavor to incorporate human development into the natural context at all scales.
- Advocate for the acceptance of sustainability as a value system across all levels of authority.
- In all decisions, reconfirm the relationship of nature to the built environment.
- Use the continuous and iterative character of the planning process to interject values of sustainable development.

Sustainable planning acknowledges the importance of the principles of sustainable development when making decisions, and it endeavors to advance balance and harmony within the context of both natural and built environments. Sustainable planning also recognizes that sustainable development may not be fully attainable, but that every effort should be made to incorporate its values in each planning decision.

The Feasibility Study uses the principles of sustainable planning to evaluate and assess the current state of military planning. While these principles serve here as a tool for assessment, they also can be used to gauge the success of future planning efforts that strive to achieve sustainable development. By using the principles of sustainable planning as a benchmark, the military planning profession is in an excellent position to foster change and support innovation in sustainable development.



Military Planning

Military Planning

Military planning supports military missions by managing the land and facilities entrusted to each military service to ensure that the necessary infrastructure is in place to accommodate specific missions.

As the 21st Century approaches, military planning is undergoing change. Declines in force structure, decreasing budgets, and fewer resources are placing new pressures on military planning and influencing the planning business practice. In the past, military planning envisioned long-term growth. Mission requirements were often satisfied with new construction projects. In the new fast-paced, budget-conscious climate of today, funding for the military construction program has been nearly eliminated and long-term planning is irresolute. Each service has been forced to rethink its planning policies and practices; and planning is becoming a more responsive, dynamic and strategic process that supports real-time decision making.

The Feasibility Study identifies opportunities to change current planning policies and practices to help meet the challenges of the new Century. It investigates three distinct areas of planning, including:

- Policy
- Process
- Practice

Military Planning

Policy

Policy that guides professional military planning can be found in the form of Federal regulations, Executive Orders, and DoD Directives. Within the DoD, planning policy is often further defined through instructions, regulations, manuals, bulletins, and pamphlets. These policies influence planning by establishing the requirements for the military community and outlining the planning process. Therefore, policies are identified and assessed in this Feasibility Study in order to determine:

a) where policies already support sustainable planning
b) where modifications to existing policy could support sustainable planning
c) when new policy should be developed in support of sustainable planning

Policies reviewed in this assessment are listed in Appendix A.

Process

Each service has an individualized business process model that highlights unique planning products. These process models also organize the planning process around unique, service-specific organizational considerations. However, all of the service planning process models share seven core planning functions. The general planning process model shows these seven functions in Figure 6. Likewise, each of the service planning process models have been color-coded to align with this general model.

The planning process assessment undertaken for the Feasibility Study was based upon a complete evaluation of each individual service business process model (see Figures 7-9). The General Military Planning Process Model was used to draw common issues across service distinctions.

Figure 6
General Military Planning Process Model

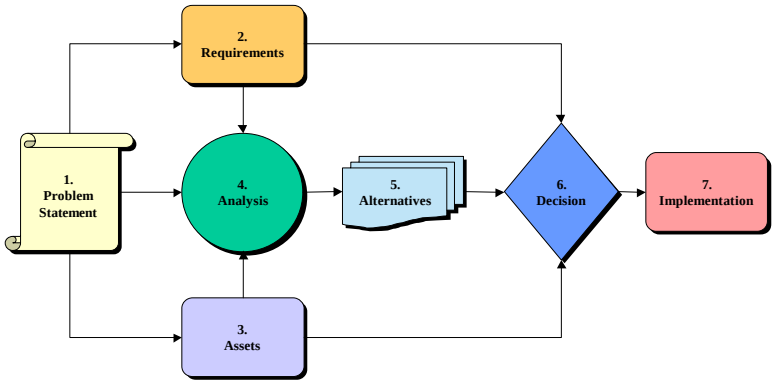


Figure 7
Army Planning Process Model

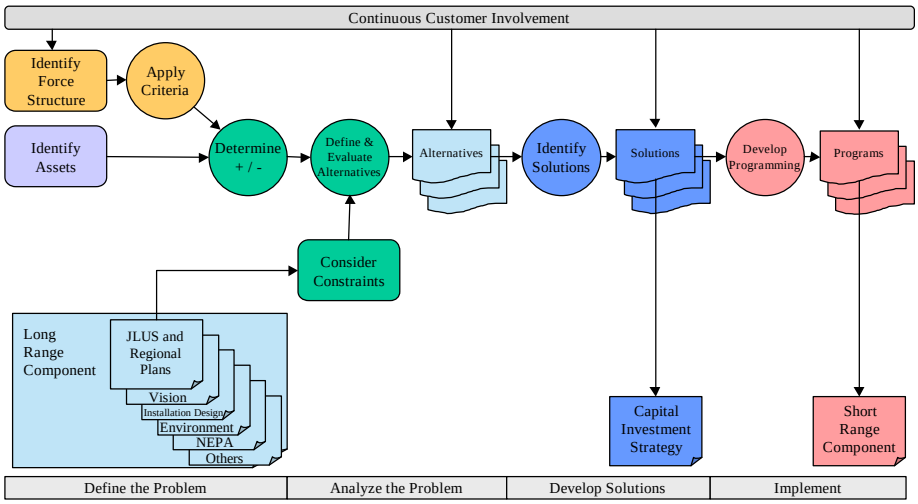
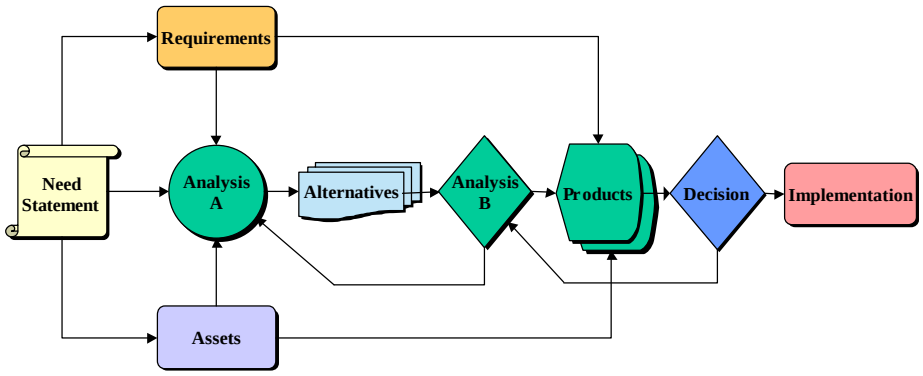
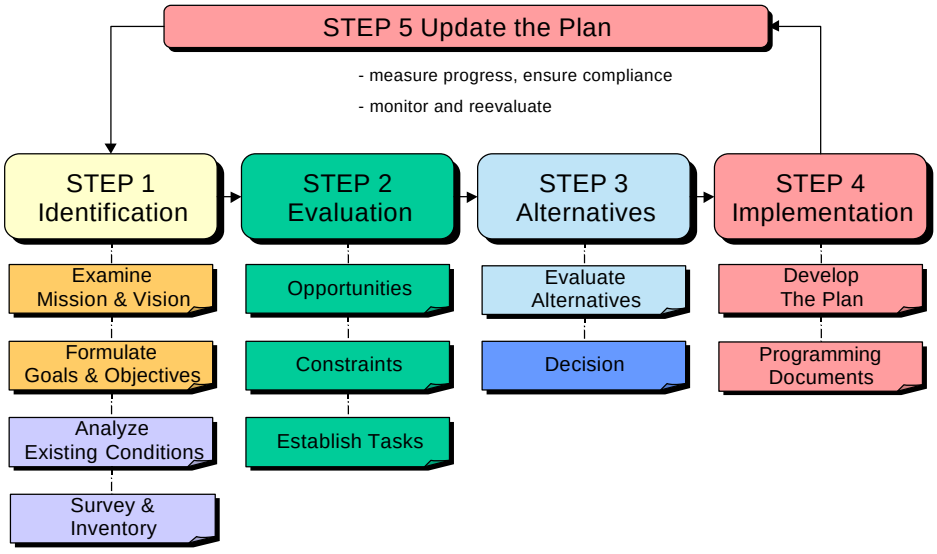


Figure 8
Navy and Marine Corps Planning Process Model



Based on a 1998 NAVFACENGCOM Shore Facilities Planning System and Navy Facility Assets Data Base Redesign report.

Figure 9
Air Force Planning Process Model



Practice

The Practice of planning can be broken down into distinct Components that are common to all military services. They include:

- Land and Facilities
- Transportation and Circulation
- Environment, Natural Resources, and Cultural Resources
- Utilities

These components may be further defined by Functions, Organizations, and Disciplines that all participate in or influence planning in these components. The Feasibility Study structured its assessment of planning practice around these areas in order to understand the issues effecting sustainable planning. The relationships between planning components, functions, organizations, and disciplines can be seen in Figures 10-14.

Functions: Functions help clarify the practice of each planning component. In many instances, these functions are not typical planning functions (*i.e.* maintenance or traffic engineering). Nonetheless, they are inseparable from planning due to both their influence upon and relationship to planning practice.

Organizations: Traditional planning organizations and nontraditional organizations that support planning are uniquely structured within each service. Organizations are typically the key ordering element for military practice. The individuals or disciplines who participate in planning and the component functions that are included are often determined by the organizational structure and its respective programmatic funding sources.

Disciplines: Professional planners are not the only individuals responsible for planning. Individuals from other disciplines are also directly involved in military planning, or indirectly influence planning due to their involvement in one or more of the component areas. These individuals represent disciplines such as engineering, architecture, landscape architecture, archaeology, history, biology, science, law, and the trades.

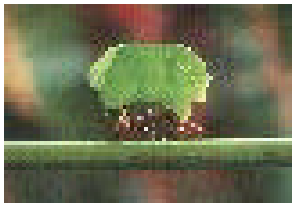


Figure 10
Land and Facilities Component

FUNCTIONS	Acquisition, Military Construction, Inventory, Maintenance, Use and Management, Disposal, Planning
ORGANIZATIONS	Real Estate, Planning, Public Works, Operations
DISCIPLINES	Planning, Engineering, Architecture and Landscape Architecture, Design, Training, Management, Law, Trades

Figure 11
Transportation and Circulation Component

FUNCTIONS	Transportation Management, Vehicle & Equipment Management, Traffic Engineering, Parking, Maintenance, Air Space Planning
ORGANIZATIONS	Engineering, Planning, Public Works, MTMC, FAA
DISCIPLINES	Planning, Engineering, Design, Management, Security, Trades

Figure 12
Environment, Natural &Cultural Resources Component

FUNCTIONS	Compliance, Conservation, Resource Management, Prevention, Restoration, Permitting, Inventory, Noise, Training, Environmental Justice
ORGANIZATIONS	Environmental, Public Works
DISCIPLINES	Biology, Archaeology, Science, History, Law, Planning, Engineering

Figure 13
Utilities Component

FUNCTIONS	Contract Management, Utility Engineering, Maintenance
ORGANIZATIONS	Engineering, Public Works, Contractors (Privatization)
DISCIPLINES	Engineering, Design, Trades

Notes

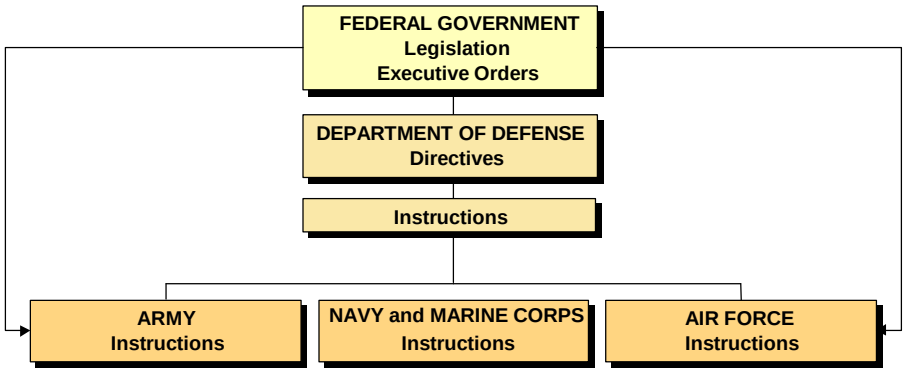
Policy Assessment

"We have created a regulatory system of command and control that limits choice and says NO, instead of one that sets goals and encourages innovation."

- Lawrence R. Codey
Public Service
Electric and
Gas Co.

The DoD and its services – Army, Navy, Air Force and Marine Corps – operate in accordance with Federal legislation. As a Federal agency, the DoD is charged with developing a strategy for implementation and compliance to policy mandates. These strategies, called Directives, often guide the services in developing their own instructions to fulfill policy objectives. These instructions provide varying levels of guidance and focus on more detailed matters of implementation.

Figure 14
Policy Hierarchy



Policy Assessment

The Policy Assessment provides insight into the military planning practice by understanding the policies that guide that practice. Understanding the procedure the DoD and the individual services use to address federal legislation is critical to understanding the policies that influence and guide planning. These policies offer opportunities for implementing sustainable development.

There are numerous policies that either directly or indirectly guide the processes and practices of military planning. This examination offers only a cursory look at the most relevant policies that play a significant role in planning. Policies that govern the targeted planning component areas were identified and examined in the initial phase of this assessment. Policy "chains" were created by tracing the origins of the instructions that are used by planning, design, and engineering practitioners. These policy chains linked the more detailed instructions to the applicable DoD policy, and to the originating Federal legislation or Executive Order. By looking at the entire body of policy, a broad, across-the-service assessment of policy issues could be performed.

The policy documents identified and reviewed as part of this assessment are listed in Appendix A. Specific policy assessment issues for sustainable planning are provided in Figure 15 as a summary list. They are also identified as Issues 1 through 6 with explanatory notes on the remaining pages of this section.

Figure 15

Policy Assessment Issues

Issue 1: **The existing multi-tiered policy structure that supports planning is cumbersome and, at times, fragmented.**

Issue 2: **Achieving policy objectives is often impeded because of the prescriptive assignment of roles and responsibilities in planning policies.**

Issue 3: **Differences in scope, procedure, and legal effect create obstacles for effectively integrating planning and environmental policies and instructions.**

Issue 4: **Current planning policies tend to limit the planning perspective to those assets found within the installation boundary; they do not strongly support planning with a regional perspective.**

Issue 5: **Current planning policies often support a planning process that assumes project-oriented solutions.**

Issue 6: **Sustainable planning would be most successful if it were supported by a high-level mandate that is clear, concise and consequential.**

Issue 1:

The existing multi-tiered policy structure that supports planning is cumbersome and, at times, fragmented.

Issue 1

Policy guidance for planning is found in numerous sources. Typically, there are two or more general planning instructions for each individual service, in addition to a collection of technical documents that are used when making real property decisions. The volume of instructions an individual has to reference for real property planning and decision making can be overwhelming. As a result, many times these guides are simply ignored.

Attempting to implement sustainable development and planning by modifying each of these policies would have little success. Even adding the principles of sustainable development into existing policies as a task, consideration, or a required checklist would have little effect on its acceptance as a value system.

Issue 2:

Achieving policy objectives is often impeded because of the prescriptive assignment of roles and responsibilities in planning policies.

Issue 2

Military policies often prescribe roles and responsibilities to individuals and organizations which are supported by focused funding channels. As a result, agency goals have often become "stovepiped," creating disconnects between planning, real property, and environmental organizations in each service. As a consequence, these organizations generally do not interface with one another, even on common issues; their policies, functions, and budgets are entirely separate. Achieving common objectives, particularly those related to real property decisions, is hindered in this atmosphere.

The prescriptive nature of military policies also results in frequent disconnects between the policies that influence planning and actual planning practice. Policies written when the individual services were larger may not align with current practices. Organizational changes have created situations in which instructions are guiding individuals or organizations that no longer exists. Because the roles and responsibilities assigned by these instructions are prescriptive and specific, policies can become defunct as the military services are reorganized.

Restructuring and downsizing throughout the DoD are making it necessary to revise planning policies to accommodate these changes. These efforts have been undertaken in an ad hoc fashion and have not focused on overcoming organizational segregation. The need to update many of these policies creates an early opportunity to focus on sustainable planning and overcome organizational segregation by rewriting the policies with a new focus on sustainable development.

Issue 3:

Differences in scope, procedure, and legal effect create obstacles for effectively integrating planning and environmental policies and instructions.

Issue 3

The goals and objectives established in current planning and environmental policies are quite different, yet the two have a direct relationship to and impact upon the land and built environment. Planning policies focus on long-term growth and development in support of mission. Environmental policies place limitations on that growth. Consequently, the planning and environmental missions of installations tend to have an adversarial relationship. Environmental programs and practices in the military are centered on reaching compliance-driven benchmarks that are costly and time consuming. As a result, military leadership often views environmental issues as constraints upon mission activities. This negative perception may create barriers to adopting principles of sustainable development as an underlying value system for land and facilities planning because of their environmental undertones.

One purpose of environmental policy is to restore the balance between natural systems and human development. While the practice of environmental compliance in the military has been very successful, some of the military's environmental policies still have loopholes. For instance, restoration and rehabilitation policy has language such as "whenever practical" and "when possible" that allows the operations mission to discount the requirement, particularly when there is a high cost associated with remediation.

Environmental instructions for the military services reflect the regulatory limits for compliance established by Federal environmental policies. These compliance-driven policies do not always support innovation in seeking ways to accomplish objectives that avoid adverse impacts on the surrounding environment. Sustainable development goals are not likely to be accomplished if the military services continue to function solely within the parameters established by compliance-focused policies.

Issue 4:

Current planning policies tend to limit the planning perspective to those assets found within the installation boundary; they do not strongly support planning with a regional perspective.

Issue 4

Language found in planning policy suggests, but does not fully describe, that communities and regions located beyond installation boundaries should be considered in the military planning process. As a result, the practice of planning does not always consider how activities on military installations may affect or may benefit from neighboring communities and larger regions. Historically, military installations have benefited from strong relationships with outside communities and strategic partnerships with private organizations. These achievements are most often the result of individual efforts and are not triggered by a specific policy position.

Recent reorganizations within the Navy have focused on forming regional commands and reestablishing shore planning as Regional Shore Infrastructure Planning. These reorganizations have led to changes in policy that reflect regional perspectives. Efforts such as these, both within the Navy and in other military services, promote the understanding of an installation in a regional context and are positive steps toward sustainable planning. However, planning can only support sustainable planning objectives with a strong foundation in planning policy.

Issue 5:

Current planning policies often support a planning process that assumes project-oriented solutions.

Issue 5

Most of the existing planning policies are designed as a "one-size-fits-all" guide to installation planning. In general, these policies establish a process that assumes new construction and growth will occur and that real property needs will be satisfied with military assets at all installations. These policies do not account for recent trends in reducing force structure and budgets or for the variations in the intensity of development occurring at individual installations. Only a select number of installations support missions that will require new development. Most installations are faced with a decline in development that is expected to continue. There are also installations that may be subject to closure because of mission changes and organizational realignments.

Issue 6:

Sustainable planning would be most successful if it were supported by a high-level mandate that is clear, concise and consequential.

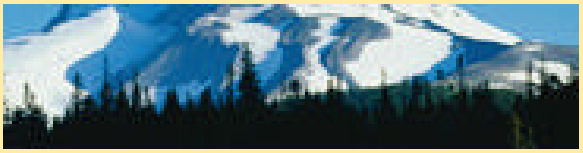
Issue 6

In its most basic form, sustainability is a value system. Adopting this value system and applying it to the built environment as sustainable development, without a mandate to do so, depends upon leadership and personal initiative. A sustainable planning or sustainable development policy mandate that is clear, concise and consequential would make sustainable planning more successful and would help support effective implementation. This mandate could draw from established environmental and planning laws such as the Clean Air Act, Clean Water Act, National Environmental Policy Act, and the Defense Authorization Bill. It could build upon the successes of these policies and draw strength from sustainable leadership and personal initiative.

A sustainable planning mandate at the law or directive level could provide better integration of existing planning and environmental mandates and could ensure sustainable values are adhered to throughout the planning process. Current planning laws are relatively vague and do not establish a strong mandate for planning. As a result, planning is often given a low priority in decision making or ignored when it could be quite useful.

Environmental law triggers each service to prepare Integrated Natural and Cultural Resource Management Plans (INRMPs and ICRMPs), as well as adhere to the National Environmental Protection Act (NEPA). These environmental mandates are positive tools for incorporating environmental effects in decision making. The INRMPs and ICRMPs and the NEPA process support sustainable planning; however, the recommendations and conclusions drawn from these environmental mandates are too often separated from the planning process or are integrated too late.

Process & Practice Assessment



as-sess *(v.) –*

1. To assign value to

e-val-u-ate *(v.) –*

2. To examine carefully

The purpose of the Process and Practice Assessment is to determine the extent to which the principles of sustainable development are currently applied within military planning and to identify additional areas where these principles may be applied in the future. This assessment is presented in eleven individual issues that apply to all of the military services.

The issues and supporting arguments were generated through five steps of evaluation and assessment. Two of these steps evaluated the *business practices* of planning and two steps evaluated and assessed the *process methodology* of planning. The final step summarized the evaluations into eleven issues and arguments.

1. General Business Practice Workshop

Interview workshops were conducted with each military service. The organizational and functional business practice of each planning component was represented, and individuals were asked to share their insights on the current state of planning.

2. Evaluation of Business Practices

The principles of sustainable development were used to evaluate how well the business practices of each service are addressing sustainability.

3. Critical Assessment of Process Methodology

The planning process methodology of each service was assessed using an analysis technique from strategic business planning known as SWOT. This analysis revealed areas where sustainability Exists (S-trength), where sustainability may Never Exist (W-eakness), where there might be Opportunities (O-pportunities) for sustainability, and where there are Barriers (T-hreats) to sustainability.

4. Evaluation of Process Methodology

The principles of sustainable planning were used to evaluate how well the individual steps of each planning process methodology in the military services are furthering sustainability goals.

5. Issues Assessment

The findings of the four previous steps were compiled and summarized into summary issues covering both planning process and practice. Specific process and practice assessment issues for sustainable planning are identified as Issues 1 through 11 with explanatory notes on the remaining pages of this section. They are also found as a summary list in Figure 16.

Figure 16

Process and Practice Assessment Issues

Issue 1:	**Sustainable planning seeks to enhance existing military planning processes and practices.**
Issue 2:	**Sustainable planning encourages a holistic, multi-disciplinary, and intra-organizational approach to address real property issues.**
Issue 3:	**Sustainable planning will be most successful when it is tied to the operations mission of an installation through common objectives and shared values.**
Issue 4:	**Sustainable planning encourages partnerships between planning and environmental organizations to effectively achieve common goals and objectives.**
Issue 5:	**Sustainable development will be most successful where understanding and cooperation between military and civilian communities are maximized.**
Issue 6:	**Building upon sound planning practices that already exist can ensure a smooth transition to sustainable planning.**
Issue 7:	**Sustainable planning places value on open space and strives to integrate natural and built environments.**
Issue 8:	**Sustainable planning would be most successful if complete, accurate, timely, quantitative and qualitative asset data were available for both built and natural inventories at all times.**
Issue 9:	**Sustainable planning has great potential to provide a positive return-on-investment to the mission it supports.**
Issue 10:	**True cost accounting, which includes complete first and life-cycle costs of development, can support the value of sustainable planning and development.**
Issue 11:	**Sustainable planning supports improvements to the financing of both planning and program implementation.**

Issue 1:

Sustainable planning seeks to enhance existing military planning processes and practices.

Issue 1

Military planning has historically centered on project planning that, until recently, resulted in new development and growth. This practice was supported by a well-funded military construction program. The majority of policies, organizations, processes, and practice today remain focused on individual projects instead of exploring ways to satisfy mission needs while promoting sustainable development goals.

Problem Statement

The Navy is currently examining ways to improve their planning process to be more responsive to mission decision-makers. The definition of the planning problem, or needs statement, is evolving within the Navy's new regional process. The Navy has added a set of parameters to the standard quantifiable need. For example, additional parameters may include "...within a 10 minute walk to barracks," or "...co-located in an open office area" or "...with access to natural lighting." The Navy has also established consequences as part of the planning need with expectations and measures, such as "reduce overall infrastructure size," "consolidate facilities," and "use outsourcing, privatization, or dual-use."

Requirements

One of the first places the project planning focus enters into the planning process is in the "requirements" step. Facility requirements are currently determined by examining the mission and then applying established space criteria to develop a required square footage to accommodate the mission. These space criteria are generally formulaic, and lead the planner to a *quantification* of need. The criteria do not require functional determinates such as mission capacity or performance, nor does it address criteria related to sustainable development.

To fully support sustainable planning, the requirements step in the planning process should include mission needs that are *quantified* and *qualified* to measure both physical space and contextual and functional criteria. This would encourage solutions within the existing built environment that previously were not considered. It would make adding to existing infrastructures with new construction an alternative of last resort.

Analysis

Project-focused solutions are also advanced in the planning "analysis" step. Planning instructions suggest that all aspects of development be considered for the needs of an installation. In practice, the analysis has focused on quantified

"Sustainable development is a process of continuous improvement."

- The Florida House Institute for Sustainable Development

space using an asset inventory of physical space to analyze requirements based on a quantified need. Even the consideration of non-infrastructure constraints are quantified into what can be developed and what cannot. As a result, the planning analysis does not fully consider solutions that are possible within the context of both the existing built environment and the natural systems of an installation.

Alternatives

The "alternatives" typically presented in a plan range from a no-build scenario to a full build-out scenario. To fully support sustainable planning, it would be advantageous to include additional parameters such as environmental quality or natural context in the planning requirement, assets tabulation, and analysis. The alternatives would then be more likely to support sustainable solutions and less likely to focus on physical space. In the end, sustainable planning would ensure that all alternatives would be sustainable, rather than having a single sustainable development alternative amoung other growth development alternatives.

Decision

Current planning processes often support the project planning focus in the "decision" step. Typical planning supports current and future missions by translating requirements into specific projects. Decisions are focused on facility siting and project planning, and alternatives are influenced by available funding within existing project programs.

Sustainable planning views project development as part of a larger solution to support the needs of the military mission. Projects are not the goal of the sustainable planning process. Sustainable planning strives to support the mission while maximizing the efficient use of existing infrastructure, minimizing the need for new development, and ensuring that, when new development is necessary, it is balanced within the context of natural systems. The goal of sustainable planning is to influence decisions on development that focus on long-term sustainability, rather than long-term development.

Issue 2:

Sustainable planning encourages a holistic, multi-disciplinary, and intra-organizational approach to address real property issues.

Issue 2

One of the reasons planning efforts may go unrealized is that planning is often carried out without the involvement of appropriate stakeholders. When this occurs, the planning process proceeds without a comprehensive guiding vision. Those effected by the outcome of planning are not invested in the process and, as a result, the planning products may be superficial.

Although planning in all of the military services is undergoing some degree of change, it is still considered an effort to be accomplished by planners. Planners develop alternatives that are presented to decision-makers for consideration. Once these individuals make a decision, the plan is communicated to those responsible for its implementation. This process does not allow for continuous participation and communication between stakeholders; instead, it relies upon sporadic communication between disparate groups or individuals. Often, it fails.

Intra-service communication has been found to be more difficult than inter-service communication. Communication between disciplines, such as planning, design, engineering, architecture, and science, and between different levels of authority, such as installations, major commands, and headquarters, often breaks down for a variety of reasons. Interestingly, inter-service communication such as communication between planners from the Army, Navy, Air Force and Marine Corps, is generally easier. Within an individual service, the most telling breakdown in communication is often between the environmental and planning component areas and organizations.

Sustainable planning is optimized when all stakeholders participate in the planning process. Stakeholders may change from plan to plan; therefore, they need to be identified and included early in the process. In today's planning environment, the more organizations and disciplines work together and cooperate and the more focus shifts to common goals and objectives, the greater the advance toward sustainable development will be.

With sustainable planning, defining a team of experts and including them throughout the planning process will lead to better and more sustainable solutions. It is the role of the planner not only to participate in planning, but also to coordinate planning efforts of others. Mission command, military and surrounding community representatives, component experts, and disciplines should also be meaningfully involved. The more people who participate and have a stake in the outcome, the better individual goals are seen in context. Bringing together component experts and cutting across organizational boundaries to find solutions to mission needs will likely result in more sustainable and feasible solutions. Sustainable

development requires a context-orientated perspective that can only come from effective team participation.

Examples where the involvement of stakeholders from other disciplines can enhance existing planning processes and practices are discussed below:

- Space planning or space management, project planning, facilities maintenance, and environmental management are all affected by and support decisions being made about facilities. Procedurally, each of these component areas may follow a similar process methodology; however, their funding programs and organizational missions are generally not considered as part of general planning. Facilities issues are becoming increasingly important to planning as non-construction alternatives are sought instead of new construction alternatives. Stakeholders who should participate in the planning process to develop these alternatives are planners, architects, engineers, designers, and trade professionals.

- Individuals from environmental organizations participate sporadically in facilities and land planning. Generally, this participation is limited to the communication of environmental data that is provided to place constraints on development in accordance with environmental regulations. Environmental compliance follows a process methodology similar to comprehensive planning; however, it focuses on managing environmental assets and ensuring that all activities comply with environmental regulations. The environmental organizations respond to planning typically through an environmental review of proposed projects. This forces a situation that is reactive, and many times does not allow for environmentally sound and sustainable planning decisions.

Issue 3:

Sustainable planning will be most successful when it is tied to the operations mission of an installation through common objectives and shared values.

Issue 3

The purpose of planning is to ensure that facilities and infrastructure are in place to support the military mission. Mission needs are communicated to planners by the military leadership. Planning responds by factoring the mission requirements into the planning process (see Issue 1). In the dialogue between military leadership and planners, there is an opportunity to introduce sustainable development and to start a sustainable planning process that can support military missions and budgetary objectives while achieving environmental and sustainable goals.

Military leadership, either installation or regional commanders, are taking a more active and participatory role in land and facilities planning than they had in the past. The primary role of mission command is to evaluate alternatives and then make a decision on the preferred course of action. It is important that mission operations professionals and planning professionals work together to create a mission and planning vision that is united. This vision will help mission command evaluate alternatives without personal bias or political influence, while promoting sustainable development.

Achievements in environmental programs highlight the many ways that coordination between operations and planning benefit the entire installation. These achievements lead to a better understanding of how environmental and operations objectives can be met in tandem and where the environment can actually enhance mission operations. Sustainable planning could build upon these successes to fully support mission by ensuring that both the lands and facilities needed to sustain mission operations are in place and that infrastructure is balanced within the context of the surrounding natural systems.

Issue 4:

Sustainable planning encourages partnerships between planning and environmental organizations to effectively achieve common goals and objectives.

Issue 4

Planning and environmental organizations function as separate entities due to different missions, existing organizational structures, and distinct funding sources. The organizational and functional disconnects between these two groups frequently result in poor communication and coordination despite their similar focus and objectives. Efforts are often duplicated, similar data is collected by both groups and analyzed separately, and programs are executed without coordination with other groups who may be effected by the outcome.

Sustainable planning supports mutually beneficial relationships between planning and environmental organizations to coordinate on common goals and objectives, share data, and reach consensus on land and facilities issues. The focus of environmental organizations is environmental protection, conservation, restoration and compliance. Sustainable planning seeks to build on the accomplishments of these programs by taking a holistic approach to planning for facilities and land that balances the needs of mission with the natural systems that are the focus of environmental efforts.

Presently, the environmental organizations in each of the military services generate environmental data to support their efforts. Some of this information is provided to the planning community for use as overlays on existing land use analyses. These overlays act as environmental constraints on future development in compliance with environmental policies. In sustainable planning, this information would be used to fully describe the condition of the land and help illustrate the impacts development alternatives would render on natural systems.

An environmental– planning partnership can support open and cooperative communication. Sustainable planning would use this environmental partnership to generate alternatives and solutions that would consider the existing natural context and support a balanced relationship between natural systems and the built environment. In doing so, the goals and objectives of the environmental community—protection, conservation, restoration and compliance—are respected and advanced while sustainable development is planned.

Issue 5:

Sustainable Development will be most successful where understanding and cooperation between military and civilian communities are maximized.

Issue 5

Although some efforts are made to share planning information with civilian communities, planning coordination and cooperation between the military and surrounding communities does not always occur. Sometimes information is not shared due to mission and security concerns; however, the role of the military comprehensive plan, outside of its military uses, is to communicate the military mission as it is reflected in land use, transportation and utility systems, development, and natural areas that align with the surrounding community. When planning information is shared, the planning process is improved by better coordination with local communities. This cooperation leads to a better understanding of physical and functional relationships, ensuring longer lasting and better planning solutions.

AICUZ, RAICUZ and JLUS

Coordination and cooperation between the military and civilian communities is occurring with Air Installation Compatible Use Zone (AICUZ) and Range Air Installation Compatible Use Zone (RAICUZ) plans. AICUZ and RAICUZ plans greatly influence land use both within and beyond installations wherever there are air operations. The main objective of the AICUZ and RAICUZ programs is to minimize encroachment of incompatible land uses with air operations. AICUZ and RAICUZ plans are shared with surrounding communities, but coordination is sometimes problematic for the following reasons:

1) AICUZ or RAICUZ data may be outdated or inaccurate.
2) Military personnel may not be available to address the public's needs.
3) There may be a lack of communication between engineers who generate AICUZ and RAICUZ plans and pilots.
4) AICUZ and RAICUZ land use designations may not align with local zoning maps.

Joint Land Use Studies (JLUS) uses AICUZ data in a community planning context to encourage cooperative land use planning between military installations and surrounding communities, and to reduce the operational impacts on adjacent land. The JLUS ensures that future public and private development around the military installation will be compatible with both the military mission and the development needs of the community. It has the potential to be one of the most valuable tools to foster coordination between the military services and the surrounding communities. Unfortunately, these studies are not conducted at all installations, nor are they accomplished on a regular basis.

"It is better to address problems through a more collaborative and holistic systems approach because such problems are diffuse, multidisciplinary, multiagency, multistakeholder and multisector in nature."

- Beth Lachman
Critical Technologies Institute

Privatization of Maintenance Functions and Utility Services

The recent privatization of the military's facility and infrastructure maintenance functions and utility systems is an effort to support military installations through partnerships with the civilian community. This may benefit the military services in the long run, but there are issues to be addressed and obstacles to be overcome in the short term.

Presently, planners are not involved in the day-to-day operations of facilities and infrastructure maintenance. Through privatization, planning will be further removed from these functions. Once utility services are privatized, military planners will have an even more difficult time planning for changes in service demands and managing utility corridors and access to distribution equipment. One of the primary objectives of sustainable planning is to focus on mutually beneficial strategic partnerships that most efficiently solve issues regarding land and facilities development. Privatizing these two critical functions furthers this goal but, at the same time, adds to the list of stakeholders that should be involved in planning from the installation and surrounding community.

Regional Planning

The Navy is addressing the larger community and regional context through recent changes in their Regional Shore Infrastructure Planning. The influence of the Navy's Regional Commanders is considerable both inside and outside the boundaries of the installation. They are involved in relationships and partnerships between installations and surrounding communities that require a regional and context–oriented perspective of the Navy's place in the region. Sustainability focuses on contextual and functional relationships and their impacts on the community and region as a whole. The Navy's new regional perspective has potential to support sustainable development with its regional perspective and its focus on coordination and cooperation among individual installations and the civilian communities.

Issue 6:

Building upon sound planning practices that already exist can ensure a smooth transition to sustainable planning.

Issue 6

Currently, there are examples within planning practice in each of the military services that closely resemble what is defined as sustainable planning. These practices could easily be enhanced, modified or refined to make planning more sustainable. They could also support greater integration between planning component areas, be responsive to mission needs, increase the type and accuracy of data used to support planning, and make planning more cost effective. Examples of these practices are discussed below.

Army

The Army Long Range Component Plan (LRC) integrates the established values of all stakeholders and the components of planning (land, facilities, transportation, etc.). It is used to enhance regional and community links, show relationships in planning considerations, and represent command vision. The Army has also developed a new Summary Development Plan (SDP) as part of the Real Property Master Plan (RPMP). This abbreviated plan attempts to be more flexible and supportive of daily mission decisions. It represents both the need and the desire to make planning more responsive to the mission it supports.

Navy and Marine Corps

The Navy has recognized the need to include natural components and system characteristics into installation, regional, and service-wide inventories. It is adding maps to their Navy Facility Asset Data Base-Management System (NFADB-MS) that include natural characteristics (topography, geology, flora, fauna, and rivers), and cultural resource characteristics (i.e., Native American tribal grounds and migration patterns) in a GIS format. Several installations have developed in-house CADD systems for their engineering systems and are using the latest GIS technology to integrate graphic data and files for use by other base functions. There are additional natural system characteristics, such as habitat, viewsheds, and ecosystems, that could also be included. The Marine Corps, in particular, recognizes the desirability of these tools and is exploring ways to export this technology to installations that do not currently have it.

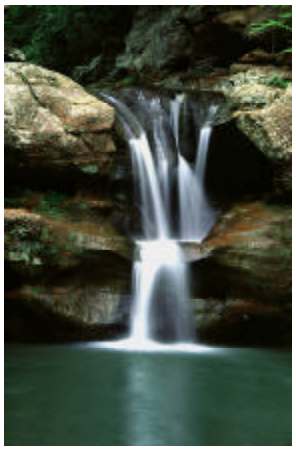
The Navy is also pursuing a new Regional Shore Infrastructure Planning approach that emphasizes a reduction of infrastructure size and cost and a realization of regional economies of scale. The goal of the Navy's new regional planning is to optimize regional land and facility opportunities in order to provide a leaner and more effective infrastructure. A regional perspective is a great opportunity to align the Navy with the goals of sustainable planning.

Air Force

Air Force Planning Assistance Teams (PATs) are providing high intensity, concentrated planning efforts to customers in response to immediate mission needs. A multi-disciplinary team is assembled to provide quick planning support in an effort that is typically one to two weeks long. In addition, contingency General Plans (GPs) and special planning studies like the Area Development Plan (ADP) have also been added to Air Force planning. The GPs and ADPs provide base commanders with feasible, specific actions that can be accomplished in the near term future. These abbreviated plans are flexible and supportive of daily mission decisions. This approach to planning is an excellent example of a way to make planning more responsive to the mission it supports.

All Services

Across the militarily services, installations are required to develop Installation Natural Resource Management Plans (INRMPs) and Installation Cultural Resource Management Plans (ICRMPs). These surveys provide a picture of an installation's natural and cultural elements and how they interact with the functions of the installation. These plans are useful for understanding both the natural systems and cultural elements that form the context of development and for supporting sustainable planning by establishing the natural framework for planning decisions.



Issue 7:

Sustainable planning places value on open space and strives to integrate natural and built environments.

Issue 7

All of the land managed by the military services is assigned a land use category. One of these categories is "open space" which is assigned to a number of valuable functional classifications such as buffer, outgrants, safety zone, contingency area, or areas for future development. Under this scheme of land use, open space—an otherwise physical description—is used for a number of functional uses and is not valued on its own merits. In fact, if open space is not classified with one of the above mentioned functions, it is deemed surplus and is designated for removal from the holdings of the military service. This perspective leads open space to be treated as a commodity—something to be assigned a function and used or consumed.

In sustainable development, nature and development are inextricably linked. Sustainable planning values open space and integrates it effectively with all functional uses of the built environment. The following areas provide an assessment of the importance of an integrated and valued approach to open space in military planning.

Environmental Stewardship

The environmental stewardship mission of the military services begins to recognize that open space is of value to an installation. However, open space is still considered a "manageable" resource. This is due in part to the environmental stewardship mission that is based upon the precepts of environmental protection defined in environmental regulation. If there is no mandated reason to protect open space, it is likely to be used, or it may be taken out of the holdings of an installation. This perspective generally limits the extent of environmental stewardship to protection or use-or-lose.

Planning Process

From the definition of requirements to the consideration of assets and the analysis of conditions, many of today's planning efforts attempt to support the mission by quantifying land and facilities. Even environmental information that includes natural context and open spaces is quantified into how much is a constraint to development and how much is an opportunity for development. The planning process is forced to consider open space as a commodity. This process does not allow for open space to be considered integral to development and mission.

"As long as the people of your culture are convinced that the world belongs to men and that their divinely-appointed destiny is to conquer and rule it, then they are of course going to go on acting the way they've been acting for the past ten thousand years. They're going to go on treating the world as if it were a piece of human property and they're going to go on conquering it as if it were an adversary. You can't change that with laws. You must change people's minds."

- Author
Daniel Quinn in
Ishmael

General Attitudes Toward Open Space

Conflicts arise between the military mission and the legislative mandates implemented by environmental organizations. Often, compliance with environmental regulations is viewed as a constraint by military leadership who feel environment issues should not interfere with the military mission. This "mission-first" attitude has also led to a view of facilities, infrastructure and land as mere tools that are available to support the mission. In a mission support mode, open space is only seen as a commodity that is either useful or useless to the military mission.

Military use of land has long-term consequences that affect both communities and natural systems. Sustainable planning addresses these consequences by valuing both the built and natural environments and recognizing the inseparable relationship between the two. As a result, sustainable planning would have a positive impact on how military missions are supported. Missions are actions that tend to change, while land and facilities built to support these missions are relatively static. The facilities, infrastructure and open space that support a military mission remain long after the mission is accomplished. By recognizing these long term impacts and incorporating open space in relation to all other aspects of the built and natural environments, sustainable planning can actually enhance mission performance. Sustainable planning can provide mission with a perspective that respects the impacts of its actions on the larger ecosystem.

The current treatment of open space within the military services is contrary to the principles of sustainable planning. Sustainable planning recognizes the integral relationship between development and natural systems knowing that the incorporation of open space in a planned development scheme can actually enhance the quality of that development. Sustainable planning does not classify open space as a functional land use unto itself; it promotes existing natural features and systems as an integral part of all functional land uses. It recognizes the need to protect sensitive areas, but views open space as the sum of all natural systems.

Issue 8:

Sustainable planning would be most successful if complete, accurate, timely, quantitative and qualitative asset data were available for both built and natural inventories at all times.

Issue 8

The lack of accurate and comprehensive data and the ineffectiveness of technological tools impacts the entire planning process and effects all of the military services. Good asset inventories with information on both built and natural conditions inform planners and decision makers and enable them to incorporate sustainable planning. Existing inventories often lack qualitative information and data on natural systems and the regional context that describe the relationships between facilities, infrastructure and environments. Typically, planners have been given the political and financial burden of maintaining accurate information. The planning process itself, stalls or even stops when trying to generate this information. With accurate asset inventory data available at all times, planning if free to respond to mission needs at any time with sustainable development solutions.

Presently, the military services all place a different level of priority on the accuracy of their asset inventories for land, facilities and environments. The following discussion represents situations across the services.

Army

The Army's real property planning system focuses on the asset database maintained within the Integrated Facility System (IFS) and the associated Real Property Planning and Analysis System (RPLANS). The IFS reliably maintains data on all Army facilities and the RPLANS is a very sophisticated tool for matching mission requirements to facilities. Both are essential to the Army's budget and stationing processes, and are major systems supporting Army installation management business processes. Both have also continually evolved over two decades and have significantly improved their capacity for sophisticated analysis, as well as their ease of use and user access. However, the two systems depend on well-trained personnel at the installation level that are not always available because of shrinking staffs. Commanders and directors of public works do not always recognized the importance of these systems, although renewed attention by HQDA has improved data maintenance.

Once not a part of the IFS, quality analysis has now significantly improved with the user inspection procedures initiated as part of the Installation Status Report (ISR). The ISR provides a global assessment of the installation's capability to support its assigned mission using the same measures used to evaluate other aspects of unit combat readiness (C-1 through C-4). It is an important tool for commanders at all levels.

Although the Army has a number of strong tools for analyzing facilities, it has trouble with the aspect of facilities interrelationship to organizational, social and natural environments. This analysis is less adaptable to automated tools; it generally depends on professional experience and judgement. At the local level, it is given over to the realm of the professional planner, particularly where a strong planning process has been institutionalized. However, at higher levels it enjoys less support due to difficulty translating the measures used for planning at the broader level.

The primary tool used for analyzing spatial relationships is the Geographic Information Systems (GIS). Army GIS acquisition has been fragmented and is usually developed within organizational stovepipes. Though many installations may have GIS, there is little commonality and limited data exchange despite accepted Tri-Service Spatial Data Standards and compatible hardware and software. The barriers are chiefly organizational. For instance, environmental GIS data is often not shared with facility management systems. Only a few installations are able to fully use GIS as an installation planning tool. These installations typically have a Commander who recognizes a strong GIS manager and commands support for integration.

Navy and Marine Corps

The Navy places a high priority on asset inventories. Partly as a result of Base Realignment and Closure (BRAC), the Navy has instituted a data management tool at the installation level that combines the strengths of CADD, GIS and database management system technology. In locations where these tools have been successfully implemented, management and planning efforts have improved.

The Navy also centrally manages a Navy Facility Asset Data Base Management System (NFADB-MS) that is updated with land, facilities, and construction data from individual bases. Technological improvements planned for this system include a relational database and direct web access. A recent redesign study recommended further technical and operational improvements that include expanding the operations and maintenance information for each facility and adding link references to CADD floor plans and GIS natural and base conditions maps. By policy directive, it is the responsibility of Navy regions to ensure that accurate land, facilities, infrastructure, and environmental data are available for planning and mission decisions.

Air Force

Asset data throughout the Air Force is often limited. There are no centrally controlled funds allocated to prepare and maintain accurate inventories prior to the beginning of the comprehensive planning process. Sometimes accurate data is generated from a program outside of planning or because of a special command issue. However, if planning incurs additional costs to generate good data, the planning process may actually be stopped when the cost is considered to be too high.

Issue 9:

Sustainable planning has great potential to provide a positive return-on-investment to the mission it supports.

Issue 9

The mission vision that planning supports often changes as frequently as commands change. This can seriously impede planning's ability to temper short-term decisions with the long-term effects on community and the environment. Decision makers are more likely to spend money to reduce immediate costs than to reduce long-term costs. In addition, products used to communicate a long-term planning vision are often programmed for change every five years. These changes and the frequency of changing commands impede the implementation of long-term land, facility, and infrastructure objectives. Sustainable planning focuses on long-term economic sustainability by placing short-term mission goals within a single, comprehensive sustainable development strategy.

The military services currently support a number of programs with both immediate and long-term returns including forestry, agricultural outleasing, and hunting license programs. These programs often provide cash support, physical improvements, and a reduction in maintenance expenditures. They are popular with military leadership and represent sound stewardship of public lands. The Energy Program also provides considerable cost savings, while helping to emphasize the impact mission actions have on the environment.

The Pollution Prevention (P2) program also provides long-term cost savings to installations. However, pollution prevention is sometimes met with resistance because savings are not always experienced in a single command tenure. While the P2 program helps to emphasize the impact mission actions have on the environment, the cost savings are not wholly understood. At the present time, there are no cost assessments on the P2 program by either environmental or planning organizations. Only the Air Force has attempted to do a limited cost assessment.

Sustainable planning's return-on-investment is likely to be recognized through more long-term savings. It is possible that sustainable planning, design and development efforts may experience the short-term obstacles that programs such as P2 are currently facing. However, sustainable planning can be successful when long-term, positive, sustainable returns are defined as the measure of success for short-term investments.

Issue 10:

True cost accounting, which includes complete first and life-cycle costs of development, can support the value of sustainable planning and development.

Issue 10

Often times in planning, the selection of a preferred alternative is based upon the projects that can be completed at the lowest cost, in the shortest period of time, and bring the greatest consensus. Unfortunately, these alternatives are not always the best solution for the installation or the organization.

The motivating factor in the selection of the preferred alternative is typically a "least cost" decision. Cost accounting is heavily weighted toward a consideration of first costs. Life-cycle costs, which calculate the cost from conception to demolition, are factored into each alternative, but are not given the same weight as first costs. In the final decision, alternatives with the lowest first cost may be selected even though another alternative may have the lowest life-cycle costs. Sustainable design initiatives within alternatives are often dropped because the costs associated with implementing them do not fit into standard costing parameters, or are viewed as additional costs that require extensive justification. When the project is submitted for funding program approval, first costs are examined and the sustainable design solutions are not supported. The military services need to account for both first and life-cycle costs of development in order to support sustainable planning and development.

In addition to life-cycle costing, sustainable planning and development often use a costing equation that accounts for the "true" costs of development, sometimes referred to as environmental accounting. True costs include both typical cost factors and the positive and negative effects on the environment that could result from development. By employing an accounting system that evaluates alternatives based on true first and life-cycle costs, planning decisions would be based upon a set of alternatives whose full costs are revealed. This would allow more sustainable alternatives to be equitably compared with cheap "first cost" solutions and may show that the more sustainable alternative would be the one that has the lower overall cost associated with it.

Issue 11:

Sustainable planning supports improvements to the financing of both planning and program implementation.

Issue 11

In tight fiscal times, very little time and money is available for planning. Large-scale planning efforts are thought to be too costly, too time-consuming, and inflexible. Planning, implementation, and maintenance programs suffer from inadequate coordination and disproportionate funding. Sustainable planning emphasizes the need to coordinate funding to maximize planning resources and focus on common goals and objectives.

Planning is currently funded by organization and program. Separate components of planning, such as the environment, land planning, and facilities management, are given a disproportionate level of funding based on what organization and program is funding them. This leads to dramatically different allocations of resources, staff, technology, and tools in each of the planning and planning-related services. The operations and maintenance funding pools that support planning services are shrinking and leading planning organizations to be "downsized." Disproportionate funding of planning and planning-related organizations has led to duplication of data sources and planning related tasks resulting in inefficiencies throughout an entire service.

Program implementation and project execution are most commonly funded through operations and maintenance, major repair, and military construction programs. Much of the funding for these programs is project specific and is separate from planning. With lack of proper oversight, these separate funding controls allow programs to occur and projects to be implemented without a sound foundation in planning.

Reductions in available operations and maintenance funds are also leading to the increased deterioration of existing development and infrastructure. Under the current organization and functional structures, planning is not involved in the maintenance of facilities and infrastructure. Therefore, maintenance work can only react to the day-to-day needs of an installation. It cannot repair or upgrade based on a coordinated plan or set of priorities. Instead, maintenance is performed on an as-needed basis or in an ad-hoc fashion.

If planning, implementation, and maintenance funding were better coordinated, development solutions could be executed based upon priorities established through a more comprehensive and sustainable process. Existing development would be used to satisfy common goals and objectives and to fulfill mission needs with solutions that further the goals of sustainable development. Furthermore, sustainability may streamline planning by reducing the time needed to prepare plans, increasing the efficiency of the process, and eliminating the need to "fix" the results of poor planning.

Opportunities

Opportunities

"Creating sustainable communities in not simply a matter of avoiding a few wetlands, or saving a few acres of open space or putting in place a few nonprofit best management practices. Rather, it is a matter of considering ecological limits and environmental impact at every aspect of community design, from the energy efficiency of buildings to the regional transportation system to how the industrial and commercial sectors go about business."

- Timothy Beatley

The primary purpose of the Feasibility Study is to identify opportunities to enhance, supplement, or expand military planning through the principles of sustainable development. The opportunities presented in this section spring from an examination of planning policy, process and practice. Each of these areas has been evaluated and assessed with great respect for planning and realizing that planning is essential to the overall military mission.

The opportunities for sustainable planning identified in this Study are in education, policy, funding, partnership, mission, practice, process, stewardship, nature, control and costing. These opportunities can effectively transition planning in each service into a more holistic, strategic, and effective type of planning. The eleven general areas of opportunity can be seen in Figure 17 and are described on the following pages. The opportunity areas and supporting details identified here are not solutions. It is the responsibility of the military services to individually or collectively develop action plans to seize these opportunities and implement change. If these changes are made, sustainable planning will provide lasting value to the mission it supports and the world environment at-large.

Opportunities

Figure 17

Sustainable Planning Opportunities

EDUCATION:	**Educate and train military leadership, management, and service personnel about sustainable development values.**
POLICY:	**Prepare a policy mandate establishing a sustainable development initiative that includes an education program, sustainable planning, and an indicators program.**
FUNDING:	**Modify organizational and program funding to support sustainable planning.**
PARTNERSHIP:	**Support sustainable planning through strategic partnerships.**
MISSION:	**Incorporate sustainability in all decisions to make planning more relevant to the operations mission.**
PRACTICE:	**Broaden the scope of planning to include component organizations that adhere to the same sustainable planning principles.**
PROCESS:	**Fully integrate sustainable development into the process methodology of planning.**
STEWARDSHIP:	**Ensure that sustainable use of public lands, including a sustainable relationship with surrounding communities and larger natural systems, is part of military stewardship.**
NATURE:	**Recognize the value of natural open space as essential to sustainable development in all land uses.**
CONTROL:	**Formalize a sustainable planning statute to provide a sustainable basis for mission decisions, planning proposals, and as a long term control on development.**
COSTING:	**Use full and true cost accounting procedures to show the value of sustainable planning and development.**

Education:

Educate and train military leadership, management, and service personnel about sustainable development values.

opportunity 1

Sustainable development is a value system that can greatly influence military decisions regarding planning, development and the environment. The values of sustainable development can help to ensure that development and nature continue together to support both installation and world communities.

Educating and informing military personnel at all levels about sustainable development will enhance the military's value system, its decision making capabilities, and its planning. Opportunities for sustainable development education include:

- Educating planning and environmental professionals on sustainable development so that they can inform and guide decision-makers to more sustainable solutions.
- Developing a curriculum for educating mission command and officer personnel on the values of sustainability and incorporating this curriculum into established training programs.
- Enhancing existing training for planners by including an outline of sustainable planning process and practice.
- Publishing examples of guidelines, papers, and best practices to enhance the general understanding of sustainable development.
- Continually informing decision-makers on the value and benefits of sustainable planning as progress is made in this area.

Policy:

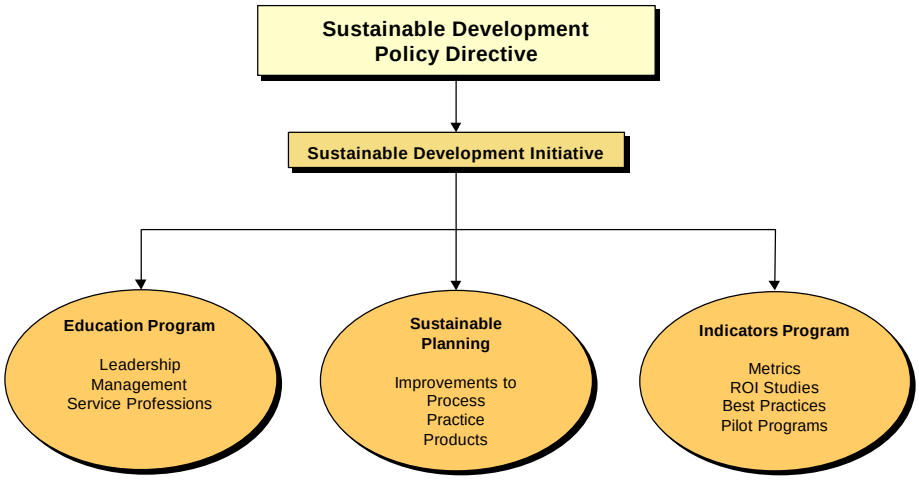
Prepare a policy mandate establishing a sustainable development initiative that includes an education program, sustainable planning, and an indicators program.

opportunity 2

Many times a policy mandate can ensure that measures are taken in pursuit of a common goal. At the present time, there is no Federal mandate that requires agencies like the DoD to comply with sustainable development standards or guidelines. Efforts by the DoD or the individual services to address sustainable development through policy mandate would be innovative and proactive. It would enable the DoD or individual service to set its own sustainable development agenda and establish policies and programs to meet its own goals and objectives. By setting a new sustainable development mandate, the DoD or services would set an example and may eliminate any negative perceptions or realities that can occur when responding after-the-fact to Federal regulations.

A policy mandate for a sustainable development initiative would be a likely way to successfully communicate the values of sustainability to military personnel at all levels and to integrate sustainable development principles into the processes and practices of military thinking and planning. This initiative could be comprised of three components, including an education program, a mandate for sustainable planning, and an indicators program.

Figure 18
Proposed Sustainable Development Initiative



"A key role for planners in the development of integrated policy is to make the complexity of the interactions intelligible to decision makers and their constituents so that decisions are better informed."

- Terry Moore and Paul Thorsnes

Education Program

The primary objective of the education program would be to educate military personnel about sustainability in order to make its principles inherent in the military value system. Leadership, management and service personnel would all benefit by understanding sustainable development and the principles of sustainable planning.

Sustainable Planning

The primary objective of the sustainable planning component would be to provide a mandate for sustainable planning that modifies existing planning policies, processes, and practices to include sustainability. The overarching goal would be to integrate the values of sustainability into the planning community and give that community the authority to ensure that the principles of sustainable development are implemented in planning decisions.

Indicators Program

The primary objective of the indicators program would be to develop sustainable development indicators that allow organizations to measure and monitor the results of specific programs under the sustainable development initiative. Sustainable development indicators would help gauge the effectiveness of the education program and the policies, processes, and practices of sustainable planning. They would also create a basis for common understanding from which individual actions can proceed. The indicators should be developed with input from multiple planning stakeholders; they should also be comprehensive, integrated, progressive, and transferable. In addition to indicators, this program could include return-on-investment (ROI) studies, best practice exchanges, sustainable planning pilot programs, and true cost accounting efforts.

Funding:

Modify organizational and program funding to support sustainable planning.

opportunity 3

Currently, funding for planning is separated and channeled into programs and organizations to fund plans supporting their specific operations. Often the activities carried out by these organizations are similar; tasks are duplicated and limited funds are unnecessarily spent. Sustainable planning maximizes available funds by seeking opportunities to fund programs and organizations collectively when pursuing common or related objectives. Several of these opportunities to improve existing funding scenarios to support sustainable planning are described in the following paragraphs.

First, the way planning itself is funded can be improved by elevating the priority of planning to a higher level. This will help ensure more adequate funding and enable sustainable planning to respond effectively to mission needs. Raising the priority status of planning would require adding planning as a budgetary line item for some of the services and moving the priority status of planning funds from a Level III to a Level I or II for others.

Another improvement to current funding scenarios would be to share responsibility for funding planning components with related organizations when there is mutual benefit. Shared funding may be used to pay for increased stakeholder participation in sustainable planning or to pay for environmental analyses used by both environmental and planning organizations. Shared funding responsibility may also improve data preparation and maintenance by distributing it outside of planning to groups such as real estate or environmental organizations.

Current funding scenarios may also be improved by pooling funding based on common goals for sustainable development. The goals of sustainable development cross organizations throughout the services; joint funds could be allocated on a discretionary basis based on sustainable planning and development objectives.

Reconsidering current funding scenarios for planning, environmental management, implementation and mission operations to focus on sustainable development solutions is likely to improve the overall financial performance of an installation.

> "Man is a part of nature, and his war against nature is inevitably a war against himself."
>
> - Rachel Carson

Achievements in sustainable planning that affect the "bottom line" may be proven through a number of evaluative measures, including the following:

- A sustainable planning pilot project that begins with the principles of sustainable planning and concludes with the implementation of sustainable design solutions featuring green design. This would then be compared to conventional processes, products and solutions.

- A return-on-investment (ROI) study using true and full cost accounting procedures of sustainable planning. This would support the value of planning efforts that achieve sustainable development.

- A compilation of best practices to demonstrate sustainable development improvements made through sustainable planning and to illustrate direct fiscal impacts (i.e. increasing employee productivity or reducing commuting times).

Partnership:

Support sustainable planning through strategic partnerships.

opportunity 4

It is widely recognized that planning considerations and planning decisions greatly impact the military community, the surrounding civilian communities, and the larger region. Sustainable planning recognizes the larger natural and human ecosystem and works toward creating a balance between natural systems and the built environment. The military community can benefit by forming and enhancing creative and strategic partnerships through sustainable planning.

Historically, strategic partnerships have done very well in the military services. Sustainable planning uses strategic partnerships to support sustainable development solutions both on and off an installation. These partnerships may be formed with other military services and communities, the surrounding civilian communities, private industry, and educational and research institutions. The opportunities for mutually beneficial relationships among these potential partners are discussed below.

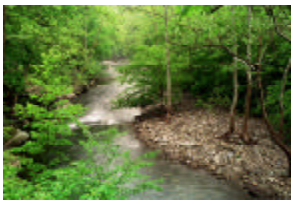
Other Military Communities

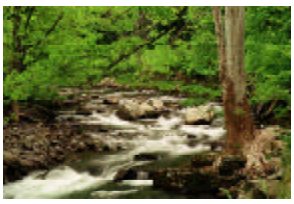
Sustainable planning should support strategic alliances with nearby military installations and develop partnerships that highlight common functions and resources. Typically, inter-service communication is strong; however, sustainable planning can benefit from enhancing existing relationships and building new ones. In particular, alliances between service planning organizations would help implement sustainable development as each service pursues new sustainable planning initiatives.

Environmental Organizations

Both planning and environmental organizations consider the development impacts of military operations on the environment. Environmental organizations focus on environmental restoration, conservation, protection, and compliance, while planning organizations look at ways the built environment fits into the natural environment. A strategic partnership between the two groups, focused on ways to share efforts and integrate processes, would further sustainable development goals as well as help each group meet their own individual objectives. An environmental planning partnership could accomplish the following:

- Establish common sustainable development goals and objectives and define a sustainable planning process that is complimentary to the intent, scope, and procedures of environmental management.





- Integrate environmental regulatory reviews in planning by conducting these reviews early in the planning process.

- Share expertise in studies and analyses, particularly in new sustainable analyses, such as contextual ecosystem analysis.

- Share inventory data and other information.

Surrounding Civilian Communities

Sustainable planning within the military services could benefit from strategic partnerships with surrounding communities. These partnerships can enhance military sustainable planning efforts by accomplishing the following:

- Developing planning alliances with local community planning agencies for the mutual benefit of all.

- Examining current models, proven processes, and measurable successes to glean information that would be useful for military sustainable planning.

- Sharing nonclassified information on land, facilities, infrastructures, and the environment that have long-term community impacts with the surrounding community.

- Using sustainable planning documents to enhance an understanding of sustainable development in the community.

Private Industry and Research Institutions

Partnerships with private industry and with educational and research institutions could support innovation in sustainable planning for the military services. Given the emphasis throughout the military on operational efficiency, these partnerships may offer viable planning alternatives and solutions to military mission issues. Specifically, strategic public-private partnerships can provide the following:

- Reduce research and development costs by using commercial off-the-shelf (COTS) software and other technology tools in planning.

- Incorporate sustainability principles as a requirement of vendor, contractor, and other private contracts.

Mission:

Incorporate sustainability in all decisions to make planning more relevant to the operations mission.

opportunity 5

Sustainable planning offers an opportunity to make planning more relevant and responsive to the operations mission of a military installation. It brings an environmental understanding to planning which *supports* the operations mission. It also demonstrates to decision-makers the benefits that can be realized from sustainable development rather than showing only the impact of mission *on* the environment. Sustainable planning connects planning to mission decision-making by revealing the relationships between missions and the environment, and the environment and development.

Sustainable planning should be important to mission commanders, just as it is to planning and environmental professionals. A sustainable military installation should be viewed by mission decision-makers as a necessary component of the overall mission. Sustainability can connect planning and mission for the benefit of both. The following actions are potential methods for tying sustainable planning to the operations mission.

- Link sustainable planning to mission objectives by incorporating principles of sustainable development into operational mission statements.
- Include the values of sustainability in the mission value system and highlight sustainable development as an element of mission sustainability.
- Develop new policies that link mission planning and real property planning to lessen organizational segregation that can hinder the mission outcome.
- Establish accountability for sustainable development at leadership and management levels.
- Highlight achievements in sustainable development by recognizing individuals and organizations through existing and new awards programs.
- Support collaboration between planning and mission operations during mission visioning efforts by including the principles of sustainable development and sustainable planning.
- Monitor and evaluate the implementation of sustainable development through sustainable planning with an effective set of measures and consequences.

Practice:

Broaden the scope of planning to include component organizations that adhere to the same sustainable planning principles.

opportunity 6

Sustainable planning examines a wide breadth of potential solutions and takes a holistic approach to issues. It requires a multi-disciplinary and intra-organizational approach to develop a comprehensive, long-range and strategic plan with realistic implementation strategies. Sustainable planning is supported by input from planning experts in each of the planning component areas, including land and facilities, transportation and circulation, utilities, the environment, and natural and cultural resources. By fusing a more multi-disciplinary approach, sustainable planning can ensure that a range of issues is considered in time to develop a more dynamic and responsive plan. Partnerships among organizations and individual professionals should be developed and enhanced to achieve sustainable development goals and the most efficient military operation. A multi-disciplinary approach could be supported by:

- Creating a sustainable planning system in which stakeholders are integrated into the planning process for better participation.
- Enhancing the sustainable planning process by including strategic and scenario planning approaches that promote diverse participation throughout the process.
- Modifying participation in planning by seeking ways to foster stronger working relationships for a more integrated planning process rather than limiting the process with organizational and program requirements.
- Incorporating sustainable development principles into the policies and practices of planning and each of its component areas to focus them on a common sustainable objective.
- Reemphasizing the need to do more formalized planning for transportation, circulation, and utilities.
- Highlighting successes of sustainable planning that results from a multi-disciplinary approach to sustainable development.

Process:

Fully integrate sustainable development into the process methodology of planning.

opportunity 7

Planning by its very nature is a focused process. In the military services, this process is defined by policies and practices that guide and direct planning enabling it to be both formulaic and creative. Each individual service has developed a unique planning process, but these processes are essentially the same. To undertake sustainable planning, these processes do not need to be replaced; they only need to be modified. The general military model for planning has seven basic steps (see section on Military Planning). A new step called Teaming, must be added and four of the seven steps, including requirements, assets, analysis, and alternatives, should be modified to enable military planning to become sustainable planning. Potential modifications are presented below.

Teaming

Sustainable planning emphasizes how important the role of a team of experts is to ensure that sustainable development alternatives are both realistic and feasible. A team of experts from various disciplines and different component areas understands the breadth of sustainable solutions and demands attention be given to every aspect of the solution. Developing teams may be accomplished by including a new "team identification" task at the beginning of the planning process. The team would include not only planning professionals and other experts from associated disciplines, but also all affected individuals, or stakeholders. Stakeholders would include a representative from military leadership with a mission operations perspective, as well as others from both the military community and from the surrounding civilian communities. The size and breadth of a team depends on the planning task.

The team of experts and stakeholders will be led throughout the sustainable planning process by a professional planner. This planner is versed in the planning process and is aware of which experts are necessary for the project. In sustainable planning, the planner is responsible for both facilitating the planning process and educating team members about sustainable development principles so they can develop sound and sustainable alternatives. Once the team is identified, the planner communicates expectations, roles and responsibilities of the team to each team member and reviews how the planning process will proceed. Collectively, the planning team will determine what degree of analysis is required, what data or other inputs are necessary for the analysis, what controls are to be applied, and what form the products should take for the plan.

> "If we change the way we make decisions, we will change the decisions we make."
>
> - Jim MacNeil
> Secretary General
> U.N. World Commission on Environment and Development

Requirements

In sustainable planning, requirements are both quantified and qualified. Currently, if the requirement is defined as a need for a number of square feet of building space, the resulting analysis, alternatives, and decision will focus on a square foot solution. Unfortunately, this type of limited requirement limits the scope of planning and, often, does not support the development of sustainable alternatives. By both quantifying and qualifying the requirement and including functional and natural resource parameters, the sustainable planning requirement should lead to a better range of sustainable alternatives. Specific modifications to the requirements step include the following:

- Ensure that the planning requirement is not predefined for a particular solution or self-fulfilling. For example, the requirement should not be for a new building; rather, it should be for the efficient accomplishment of a mission objective within standard parameters supported by certain functional and qualitative parameters.

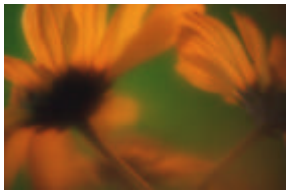
- Expand the current space requirement to include mission visioning and sustainable development goals and objectives.

- Identify and incorporate additional functional, qualitative, and sustainable criteria to existing space criteria manuals.

- Align planning criteria more closely with mission system criteria.

Assets

One of the goals of sustainable development is to increase efficiency by using existing assets to the greatest extent possible. To fully support sustainable development, it is necessary for the military community at-large to have comprehensive, complete, accurate, and timely data on existing assets in order to make sound decisions on planning, management and operations. When accurate data is available to those faced with solving planning problems, the planning process can develop solutions quickly. Data should include accurate information on facilities, infrastructure, activities, and the environment both within the installation and beyond the boundaries of an installation. This information can help sustainable planning forge a balanced relationship between development and natural systems.



Typically, environmental data has been defined by environmental compliance and environmental constraints. Sustainable planning and development redefines environmental data to include information on both the environment and its natural and cultural resources. It divides environmental data into three classifications that will help support sustainable planning, including Natural Elements and Systems, Natural Context information, and Environmentally Sensitive Areas.

Natural Elements and Systems encompass topography, hydrographic, soils, geology elements and systems that are mapped and inventoried by environmental organizations.

Natural Context incorporates system analyses, such as viewsheds, aspect, predominant winds, archaeology, and historic sites.

Environmentally Sensitive Areas are areas set aside for larger environmental reasons. They include installation restoration program (IRP) sites, threatened & endangered species areas and other areas designated for protection, conservation, and restoration. The Environmentally Sensitive Areas are typically incorporated into planning analysis as environmental constraints. These areas should continue to be protected from development and active use.

It is important to remember that Natural Elements and Systems, Natural Context, and Environmentally Sensitive Areas are connected to the larger regional context. Planners should recognize regional and global ecosystems and incorporate scale into their analyses of environmental data. The following opportunities would improve the asset step in planning:

- Expand the existing asset inventories available to planners by including environmental data that is collected and maintained by environmental organizations.

- Identify what types of environmental data are necessary to support sustainable planning in an asset database (i.e. natural elements and systems, natural context, and environmentally sensitive areas). Include this list in applicable planning policies.

- Support short-term funding increases to prepare data and develop a system for storing, updating, and disseminating information prior to planning and data collection.

"The focus and scale of sustainability efforts depend on local conditions, including resources, politics, individual actions, and the unique features of the community."

- Beth E. Lachman
Critical Technologies Institute

- Develop a strategy for the long-term maintenance of planning asset inventories. For example, the Navy is examining new ways to fund data collection and maintenance. One such way is by associating cost/benefit consequences to this task by tying space management information to utility billing by building. This helps distribute responsibility for data on particular facilities and enhances accuracy.

- Use geographic information systems (GIS) and other commercial off-the-shelf (COTS) software to support asset inventories.

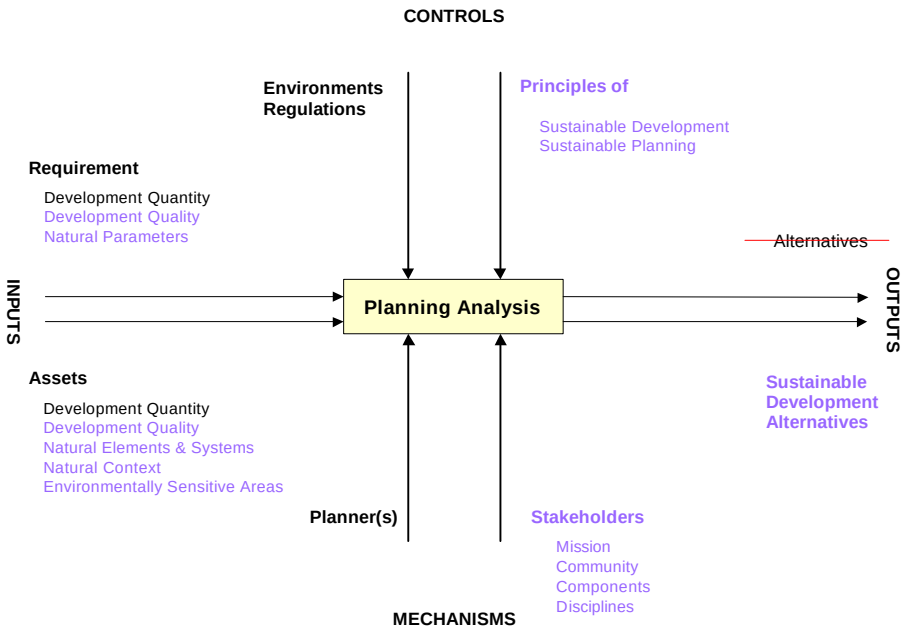
- Collect and update data at the installation level, where practical.

- Ensure that all data available to planners and other potential users is provided in a user-friendly format.

Analysis

The "analysis" step of the planning process can be improved by using the ICOM business process model to identify sustainable planning opportunities. The ICOM model is defined by Inputs, Controls, Outputs, and Mechanisms. See Figure 19 for the modified sustainable planning analysis model.

Figure 19
Sustainable Planning Analysis



Inputs are items consumed, altered, or needed to trigger a given process. Sustainable planning benefits the planning process by having natural elements and qualitative built environment elements in both the planning requirements and assets steps.

Controls are policies and procedures that are used to regulate or govern a given process. Sustainable planning improves analysis by adding the principles of sustainable development and planning to existing environmental regulation controls.

Outputs are what the process activity produces. The outputs in sustainable planning are sustainable development alternatives that have resulted from the modified inputs, controls, and mechanisms. In the end, these changes provide a degree of "sustainability" for planning analysis.

Mechanisms are individuals, machines, equipment or tools that either support or perform the given process activity. Sustainable planning modifies analysis mechanisms by using a team of stakeholders and planners rather than a single planner.

Alternatives

By using sustainable inputs, controls, and mechanisms with the existing planning process, sustainable planning will lead to sustainable alternatives. See the comparison of existing and sustainable planning methods for developing alternatives in Figures 20a and 20b.

Figure 20 a
Existing Method of Developing Alternatives

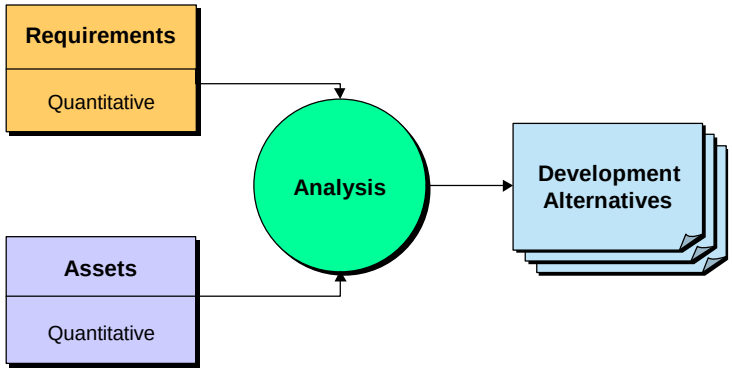
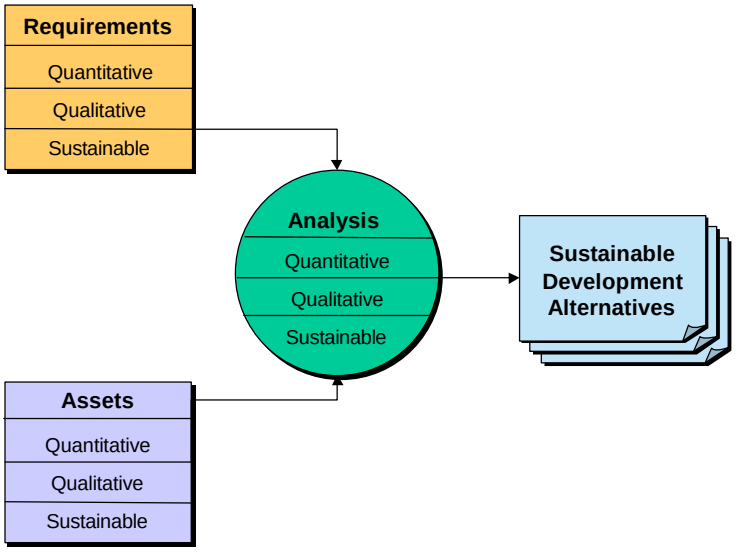


Figure 20 b
Sustainable Planning Method of Developing Alternatives



Sustainable development alternatives should first try to propose solutions within existing development. In some cases, it may be useful to also consider existing resources beyond the boundaries of an installation. Planners should consider the appropriateness of space and function, as well as sustainability when trying to satisfy mission needs within existing development. They should also consider how people access the site, how a given structure could be fitted with new technologies, utilities and telecommunications, and how renovations would impact the environment compared to other alternatives. More often than not, supporting mission needs within existing development will have greater fiscal and environmental benefits than new construction.

Alternatives that include new construction may also be sustainable. Rapidly changing technology often requires supporting infrastructure that cannot be provided by existing development. New development should be constructed on previously disturbed areas, including both cleared brownfield sites and existing underutilized facilities. Selection of a greenfield site for new development should be an alternative of last resort; it should be undertaken with the utmost regard for the site's context. All new construction of buildings and associated infrastructure improvements should adhere to the principles of sustainable or green design.

Stewardship:

Ensure that sustainable use of public lands, including a sustainable relationship with surrounding communities and larger natural systems, is part of military stewardship.

opportunity 8

The military services are charged with environmental stewardship and leadership for the land they occupy. Military leaders recognize that the public lands they use are also their responsibility to protect. In order to fully protect these lands, they must first be understood. Sustainable planning seeks to maximize understanding of land by focusing on both the built and natural environments and striving to create a balanced relationship between the two.

Military installations are often an integral component of the surrounding community. They influence the environment and activities beyond their fencelines. They also contribute to the regional and global environments. True stewardship of military lands recognizes the larger context of an installation. Sustainable planning embraces the responsibility for environmental stewardship and offers an opportunity to increase the "sustainability" of the mission by associating the objectives of environmental responsibility with those of sustainable development.

Military stewardship and sustainable planning may be better aligned if the following are implemented:

- Expose military leadership to the values and principles of sustainable development in training that is focused on stewardship.
- Include selected principles of sustainable development as measures of accountability for military and environmental stewardship.

Nature:

Recognize the value of natural open space as essential to sustainable development in all land uses.

opportunity 9

Land use classifications typically categorize open space as functional space for potential development or as constrained space that precludes development. These categorizations reinforce the separation of development and open space and treat land as a commodity that is used to support the military mission.

Sustainable development and planning redefine the relationship of nature and development as inseparable components of a larger, functional and physical living system. In sustainable planning, naturalized open space is considered as a physical element of all functional uses of land. The built environment is enhanced by using the natural context as the framework for existing and new development.

A number of specific opportunities to recognize the value of natural open space include:

- Eliminate the use of "open space" as a functional classification of land use. Instead, accept all of the functional classifications currently given to open space, such as buffer, outgrant, safety zone, contingency area, and future development as distinct and independent land use classifications.
- Institute a new functional land use category to designate environmentally sensitive areas that should be preserved and protected.
- Incorporate open space elements into the definitions of all functional land use classifications. Use them to link different land use areas and to reinforce the positive relationship of development with natural open spaces.
- Seek ways to strengthen relationships between existing development and areas of natural open space.
- Develop new facilities on brownfield open spaces before using open greenfields.

opportunity 10

Control:

Formalize a sustainable planning statute to provide a sustainable basis for mission decisions, planning proposals, and as a long term control on development.

The success of sustainable planning is heavily tied to a long-term vision. While it is true that the details of this vision are to be developed over time, it is important that the overarching goals and objectives of long-term planning remain current and enforceable. This could be accomplished by giving planning documents status as binding documents, such as the zoning ordinance used to control development in civilian planning. While civilian zoning is not a perfect system, it is the primary tool for enforcing the long-term development vision established in a comprehensive plan. Changes to the zoning ordinance and the comprehensive plan generally require approval by a publicly elected or appointed committee.

Currently, comprehensive plans, master plans and associated land use maps within the military services are authorized by the signature of an installation or regional commander. It is difficult to enforce the validity of these documents and see that they are implemented with today's organizational pressures.

Sustainable planning can make one of its largest impacts by making a number of planning documents statutory. Existing planning documents such as the Land Use Map and Land Use Plan, the Air Installation Compatible Use Zone (AICUZ) and Range Air Installation Compatible Use Zone (RAICUZ) plans, and others could become binding and enforceable documents against which all short- and long-term planning decisions are verified. Once these maps and plans are developed and made statutory, a new, more dynamic and responsive planning process could be put in-place to support mission decision making. Facility, land, infrastructure, development and environment decisions can be verified against the statutory controls. Changes to the enforcing planning documents would be subject to approval by a committee of stakeholders. Ideally, such a committee would be comprised of individuals with a variety of perspectives to ensure changes are not made because of political, organizational, or personal objectives.

Newly created sustainable planning documents, such as a sustainable development context map, could be used to enhance known planning documents and new statutory controls. The new sustainable development context map would build on existing conditions information for land use, infrastructure and natural systems with quantitative and qualitative examinations of the relationship between existing built and natural environments. This information would form a sustainable planning framework for an installation or region. The development of any new planning documents should be based on a sustainable planning process and, if appropriate, made statutory to ensure long-term sustainability.

Costing:

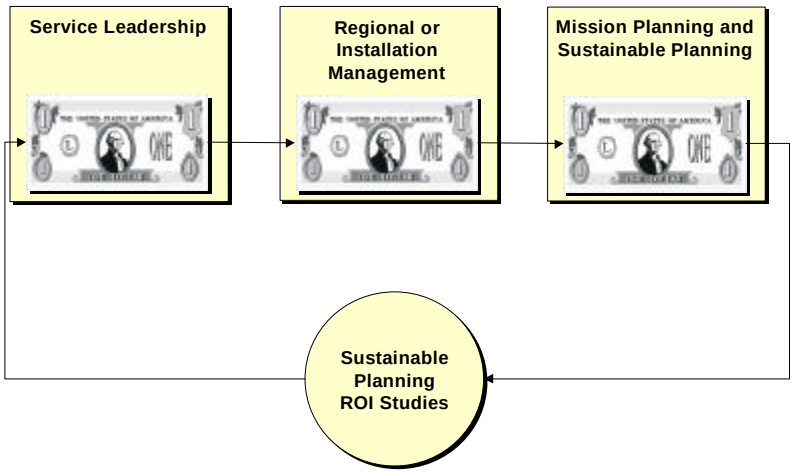
Use full and true cost accounting procedures to show the value of sustainable planning and development.

opportunity 11

One of the most tangible opportunities for expressing the benefits of sustainable development is the fiscal and environmental cost savings it may bring. The current cost accounting methodology employed by most of the military services does not disclose the full and true costs of a program, project or development alternative. By using full and true cost accounting, decision-makers are more likely to select sustainable programs and development alternatives. In many instances, these sustainable alternatives will be the lowest cost alternative.

Full and true cost accounting can also directly support sustainable planning. By using full and true cost accounting factors in an economic return-on-investment study of sustainable planning, leadership and management funding streams for sustainable planning can be justified and the future of sustainable planning assured (see Figure 21).

Figure 21
Sustainable Planning Funding Stream



Modifications could be made in the determination of first costs, the calculation of life-cycle costs, and the development of true costs.

First Costs

To support sustainable development, the first costs of a program or development alternative should include the costs for sustainable design. These added first costs, however, should not be the primary basis for a decision for or against project funding. Project documents such as the DD Form 1391 should be modified to allow for better first costing, as well as better life-cycle and true costing to support new and changing sustainable planning strategies.

"Sustainable Development is predicated on the recognition that economic and environmental goals are inextricably linked."

- National Commission on the Environment 1993

Life-Cycle Costs

To support more accurate life-cycle costing, operations and maintenance (O&M) figures should be collected for existing facilities. Efforts to collect this information are already underway; the Army is beginning to factor in O&M costs and the Navy has plans to add new O&M cost data elements to their asset inventory database. The availability of accurate O&M costs would more accurately reflect historic facility costs and allow for more accurate life-cycle cost projections. More accurate life-cycle costing will provide a better cost estimate for a project and a better comparison between proposed alternatives.

True Costs

To support more accurate cost accounting, the cost analysis methodology should switch from full cost considerations (first and life-cycle costs only) to true cost considerations (first, life-cycle and environmental costs). This will allow the true costs of planning alternatives to be considered in the analysis and decisions. Under the current system, environmental costs are not included in the equation and the expense of environmental degradation is not fully considered. With sustainable planning and true cost accounting, planners and decision-makers would focus on sustainable development alternatives that have both fiscal and environmental cost savings. To fully support sustainable development, capital improvement and capital investment plans should reflect true costs and include strategies to make projects as sustainable as possible.

Conclusion

Conclusion

Planning within the military services is quite different today than it was just a decade ago. The impacts of downsizing, organizational restructuring, and the complete closure of some installations has had dramatic effects on planning and the manner in which the military views real property. This has placed planning organizations in a state of transition at the dawn of the 21st century. It has become apparent that both slight modifications and major changes are necessary to keep planning current, relevant, and viable. Some of these changes have already taken place; recent efforts have resulted in planning becoming "smarter." The military services have developed a better understanding of the importance of complete asset inventories, the need for top performance in environmental programs, and the demand for mission sustainability.

In this atmosphere of change lies further opportunities to create a better future for military installations. Changes in planning can increase the overall quality of life for those who live and work in the military community. Planners can build a new sustainable future based on the lessons learned from the past. Sustainable planning can modify policies and change existing processes and practices to develop sustainable development solutions that cut across physical boundaries and between levels of authority, organization, and professional discipline.

One of the first tasks of a sustainable development initiative in the military is to establish policies that effectively guide change. Sustainable planning can incorporate and enhance many of the instructions now used to support real property planning. This new sustainable policy umbrella could establish common sustainable development goals and objectives, enable responsibilities to be assigned and resources to be allocated to meet sustainable objectives, and implement an integrated planning system that ensures participation in sustainable planning by all relevant organizations and individuals.

Sustainable planning creates an opportunity to improve planning by shifting the focus of military planning from project planning. Sustainable planning eliminates the growth-based, project-based analysis and decision-making methods in existing planning and replaces them with new methodologies that lead to sustainable solutions and strategies that support mission needs. These changes must begin by incorporating sustainable development principles as a value system throughout the planning process, making it more inclusive, dynamic and responsive.

Sustainable planning also makes planning more strategic by closely tying real property planning to the operations mission. Sustainable planning is long-range and comprehensive, enabling it to develop a range of future scenarios that help

regions and installations determine the most appropriate future for local mission configurations. Sustainable planning also provides flexibility for planners and stakeholders to respond to continuously changing scenarios with new strategies that focus on effective and efficient implementation.

Sustainable planning in the 21st Century will be holistic, fair, responsible, comprehensive and strategic. The Department of Defense and each military service can greatly enhance the sustainability of their missions and their communities through opportunities for sustainable planning.

Appendix A

Executive Orders

Figure A-1

Executive Orders

TITLE	DATE	REFERENCE
Protection and Enhancement of Environmental Quality	1970	EO 11514
Protection and Enhancement of the Cultural Environment	1971	EO 11593
Floodplain Management	1977	EO 11988
Wetlands Management	1977	EO 11990
Federal Compliance with Pollution Control Standards	1978	EO 12088
Environment Effects Abroad of Major Federal Actions	1979	EO 12114
Intergovernmental Review of Federal Programs	1982	EO 12372
Federal Real Property Management	1985	EO 12512
Superfund Implementation	1987	EO 12580
Federal Energy Management	1991	EO 12759
Implementation of the Federal Water Pollution Control Action an Oil Pollution Control Act	1991	EO 12777
Federal Agency Recycling and the Counsel on Federal Recyclir and Procurement Policy	1991	EO 12780
Federal Use of Alternatively Fueled Vehicles	1993	EO 12844
Federal Compliance with Right-to-Know and Pollution Preventio Requirements	1993	EO 12856
Federal Acquisition, Recycling and Waste Prevention	1993	EO 12873
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	1994	EO 12898
Energy Efficiency and Water Conservation at Federal Facilities	1994	EO 12902
Sacred Sites	1996	EO 13007
Tribal Consultation	1998	EO 13084
Greening the Government through Waste Prevention, Recycling, and Federal Acquisition	1998	EO 13101
Greening the Government through Efficient Energy Manageme	1999	EO 13123

Federal Regulations

Figure A-2

Federal Regulations

TITLE	DATE	REFERENCE
Historic Sites Act	1935	Pub. L. 100-17
Clean Air Act	1955	42 U.S.C. 7401
Sikes Act "Conservation Programs on Military Reservations'	1960	42 U.S.C. 6901, et seq
National Historic Preservation Act (NHPA	1966	36 C.F.R. 800
National Environmental Policy Act (NEPA	1969	42 U.S.C. 321, et seq
Clean Water Act	1972	33 U.S.C. 1251, et seq
Noise Control Act	1972	42 U.S.C. 4901
The Noise Control Ac	1972	Pub. L. 92-574
Endangered Species Act	1973	16 U.S.C. 1531, et seq
Forest and Rangeland Renewable Resources Planning Act	1974	Pub. L. 93-378, 16 U.S.C. 1601, et seq
Safe Drinking Water Act	1974	42 U.S.C. 1441, et seq
Federal Land Policy and Management Ac	1976	43 U.S.C. 1701
National Forest Management Ac	1976	Pub. L. 94-588, 16 U.S.C. 1600, et
Resource Conservation and Recovery Ac	1976	Pub. L. 94-580, 42 U.S.C. 6901-6907
Toxic Substance Control Ac	1976	15 U.S.C. 2601, et seq
Federal Water Pollution Control Act (Clean Water Act)	1977	Pub. L. 87-88
Soil and Water Resources Conservation Ac	1977	16 U.S.C. 670 et seq
American Indian Religious Freedom Ac	1978	Pub. L. 95-341
The Quiet Communities Act	1978	Pub. L. 95-609
Archeological Resource Protection Act (ARPA)	1979	36 C.F.R. 229; 43 C.F.R. 7
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA	1980	42 U.S.C. 9601 et seq
Forest Managemen	1980	10 U.S.C. 2665
Disposal of Recyclable Material	1982	Pub.L. 97-214, 10 U.S.C. 2577
Solid Waste Disposal Act (commonly referred to as the Resource Conservation and Recovery Act)	1986	Pub. L. 95-192; 42 U.S.C. 3251, et seq; 42 U.S.C. 6901, et sec
Superfund Amendments and Reauthorization Act (SARA)	1986	Pub. L. 95-193, 16 U.S.C. 2001
Montreal Protocol of Substances that Deplete the Ozone Laye	1987	(N/A)
Curation of Federally-Owned and Administered Archeological Collection	1990	36 C.F.R. 79
Intermodal Surface Transportation Efficiency Act (ISTEA)	1990	Pub. L. 102-240
Native Americans Graves Protection and Repatriation Act (NAGPRA)	1990	43 C.F.R. 10
Oil Pollution Act	1990	33 U.S.C. 2701-2761, et sec
Pollution Prevention Ac	1990	42 U.S.C. 13101, et sec
Energy Policy Act (EPACT)	1992	Pub. L. 102-486
Federal Facility Compliance Act	1992	Pub.L. 102-386
Protection of Natural and Historic Features of Military Installations Act	1993	Pub. L. 100-526 and 100-51(
Coastal Zone Management Ac	1996	16 U.S.C. 1451, et seq
Transportation Equity for the 21st Century	1998	Pub. L. 105-178

Figure A-3

Military Planning Policy - General

SERVICE	TITLE	REFERENCE
DOD	Installation Managemen	DODD 4001.1
	Intergovernmental Coordination of DOD Federal Development Programs and Activities	DODD 4165.61
	DOD Facility Planning and Design Guid	MIL-HDBK-1190
NAVY and MARINES	Navy Shore Facilities Programming Boar	OPNAVINST 11010.5E
	Intergovernmental Coordination of Land and Facilities Plans, Projects, and Programs	SECNAV 11010.10A
	Intergovernmental Coordination of Land and Facilities Plans, Projects and Programs	NAVFAC 11010.66A
	Command Responsibility for Shore Land and Facilities Plannir	OPNAV 11000.16A Change 1
ARMY	Army Stationing and Installation Pla	(ASIP)
	The Army Plan	(TAP)
	Master Planning Instructior	(MPI)
	Master Planning for Army Installations (RPMP	AR 210-20
	Coordination of Army Development with State and Local Governments	DA PAM 210-4
	Installation Master Planning	TM 5-803-1
AIR FORCE	Planning and Programming	AFI 32-1021 & 32-1022
	Air Force Comprehensive Planning	AFI 32-7062
	Comprehensive Planning Approach and Proces	(AF Bulletins)
	Quality of Life Planning Bulleti	(AF Bulletins)
	Comprehensive Planning Data Sources and Applicatior	(AF Bulletins)

General

Figure A-4

Military Planning Policy - Land and Facilities

SERVICE	TITLE	REFERENCE
DOD	Air Installation Compatible Use Zones (AICUZ	DODI 4165.57
	Defense Acquisitior	DODD 5001.0
	Defense Acquisition Management Policies and Procedur	DODI 5000.2
	Delegation of Authority Vested in the Secretary of Defense to Take Certain Real Property Action	DODD 5160.63
	Intergovernmental Coordination of DOD Federal Development Programs and Activities	DODD 4165.61
	Inventory of Military Real Propert	DODI 4165.14
	Joint Land Use Studies	DODI 3032.2
	Planning, Design, and Construction Criteri	DODD 4270.1
	Real Property Acquisition, Management, and Dispos	DODD 4165.6
NAVY and MARINES	Acquisition, Use by Other and Disposal of DON Real Proper	SECNAVINST 11011.47
	Air Installation Compatible Use Zone	SECNAV 11010.11
	Airfield and Heliport Planning and Desig	NAVFAC P-971
	Economic Analysis Handbool	NAVFAC P-442
	Facilities Projects Manua	OPNAVINST 11010.20F
	Facility Planning and Design Guid	NAVFACINST 1190 (revised)
	Facility Planning Criteria	NAVFAC P-80
	Implementation of Defense Acquisition Management Policies, Procedures, Documents and Report	SECNAVINST 5000.2A
	Installation Desigr	NAVFAC P-960 (*multi-service)
	Intergovernmental Coordination of Land and Facilities Plans, Projects and Programs	NAVFAC 11010.66A
	Inventory of Military Real Propert	SECNAVINST 11011.40A
	Navy Facility Assets Data Base Management System Procedures Manual	NAVFAC P-78
	Planning in the Noise Environmen	NAVFAC P-970 (*multi-service)
	Planning Services for Navy and Marine Corps Shore Activitie	NAVFACINST 11010.63C (cancelled)
	Range Air Installations Compatible Use Zones (RAICUZ) Progra	OPNAV 3550.1
	Real Estate Procedural Manua	NAVFAC P-73
	Real Property Acquisition, Management, and Disposal Policie	SECNAVINST 11011.46A
	Shore Facilities Planning Manua	NAVFACINST 11010.44E (cancelled)
	Utilization of Navy Real Propert	OPNAVINST 11011.10F
ARMY	Acquisition of Real Property and Interests There	AR 405-10
	Airfield and Heliport Planning and Desig	TM 5-803-7
	Army Long Range Facilities Plar	ALRPFP
	Army Long Range Facilities Plan Guidanc	ALRPG
	Disposal of Real Estat	AR 405-90
	Granting Use of Real Estat	AR 405-80
	Guide to Army Real Property Category Code	DAPAM 415-28
	Installation Desigr	TM 5-803-5 (*multi-service)
	Inventory of Army Military Real Propert	DAPAM 405-45
	Land Use Planning	TM 5-803-8
	Military Construction, Program Development and Executic	AR 415-15
	Planning in the Noise Environmen	TM 5-803-2 (*multi-service)
	Planning of Army Aviation Facilities	TM 5-803-4
	Range Planning	AR 210-21
	Utilization of Real Propert	AR 405-70
AIR FORCE	Acquisition of Real Propert	AFI 32-9001
	Air Installation Compatible Use Zone	AFI 32-7063
	Airfield and Heliport Planning and Desig	AFI 32-1123
	Area Development Planning Bulleti	(AF Bulletins)
	Disposal of Real Propert	AFI 32-9004
	Establishing Accounting and Reporting Real Proper	AFI 32-9005
	Fire Protection Planning Bulletir	(AF Bulletins)
	Installation Desigr	AFM 88-43 (*multi-service)
	Installations and Facilities	AFPD 32-10
	Installations and Facilities Strategic Planning	AFI 32-1001
	Land Use Planning	AFI 32-1010
	Land Use Planning Bulletir	(AF Bulletins)
	Long Range Facilities Development Planning Bulleti	(AF Bulletins)
	Outgrant of Real Propert	AFI 32-9003
	Planning and Design of Airfield	AFI 32-1026
	Planning and Programming Real Property Maintenance Projects Using Appropriated Funds	AFI 32-1032
	Planning in the Noise Environmen	AFM 19-10 (*multi-service)
	Real Property Managemen	AFPD 32-90
	Standard Facility Requirements	AFI 32-1024
	Use of Real Property Facilitie	AFI 32-9002

Figure A-5

Military Planning Policy - Environmental, Natural and Cultural Resources

SERVICE	TITLE	REFERENCE
DOD	Archaeological and Historic Resources Managemer	DODD 4710.1
	Department of Defense Strategy on Environmental Justic	(N/A)
	Environmental Compliance	DODI 4715.6
	Environmental Conservation	DODI 4715.3
	Environmental Education, Training, and Career Development	DODI 4715.10
	Environmental Effects Abroad of Major Dod Actior	DODD 6050.7
	Environmental Effects in the United States of Dod Actior	DODD 6050.1
	Environmental Planning and Analysi	DODI 4715.9
	Environmental Remediation at DOD activities overseas	DODI 4715.8
	Environmental Restoration Program	DODI 4715.7
	Environmental Security	DODD 4715.1
	Memorandum of Understanding: Native Plant Conservatic	(N/A)
	Memorandum of Understanding: Ecosystem Managemer	(N/A)
	Natural Resource Management Prograr	DODD 4700.4
	Policy for Establishing and Implementing Environmental Standards at Overseas Installations	DODD 6050.16
	Pollution Prevention	DODI 4715.4
	Protection and Enhancement of Environmental Quali	DODD 5100.50
	Regional Environmental Coordinatio	DODD 4715.2
NAVY and MARINES	Environmental and Natural Resources Protection Manu	OPNAVINST 5090.1B
	Environmental Compliance and Protection Manua	MCO P5090.2A
	Environmental Requirements Cookbool	POM-00
	Evaluation of Environmental Effects from DON Actions	SECNAVINST 5090.6
	Facility Planning and the Protection of Cultural Resources Outside the DOD	NAVFACINST 1010.70
ARMY	Cultural Resources Management	AR 200-4
	Environmental Effects of Army Actions	AR 200-2
	Historic Preservatior	AR 420-40
	Intergovernmental Coordination of DOD Federal Development Programs and Activities	AR 210-70
	Natural Resources - Fish and Wildlife Management	TM 5-633
	Natural Resources - Forest Management	TM 5-631
	Natural Resources - Land Management	TM 5-630
	Natural Resources - Land, Forest and Wildlife Manageme	AR 200-3
	Natural Resources - Outdoor Recreational and Cultural Valu	TM 5-635
	Natural Resources - Solid Waste Managemer	TM 5-634
	Procedures for Implementing the National Environmental Policy Act	ER 200-2-2
	Protection and Enhancement of Environmental Quality	AR 200-1
	Resources Management Plan (RMP	DA PAM 420-6
AIR FORCE	Air Quality Compliance	AFI 32-7040
	Cultural Resources Managemer	AFI 32-7065
	Environmental Baseline Surveys in Real Estate Transactior	AFI 32-7066
	Environmental Compliance Assessment and Management Program (ECAMP)	AFI 32-7045
	Environmental Impact Analysis Process	AFI 32-7061
	Environmental Program in Foreign Countries	AFI 32-7006
	Environmental Protection Committees	AFI 32-7005
	Environmental Quality	AFI 32-70
	Environmental Quality Protection Planning Bulletin/Manua	(AF Bulletins)
	Environmental Restoration Program	AFI 32-7020
	Integrated Natural Resources Management	AFI 32-7064
	Interagency Intergovernmental Coordination for Environmental Planning	AFI 32-7060
	Pollution Prevention Progran	AFI 32-7080
	Solid and Hazardous Waste Complianc	AFI 32-7042
	Storage Tank Compliance	AFI 32-7044
	Water Quality Compliance	AFI 32-7041

Figure A-6

Military Planning Policy - Transportation and Utilities

SERVICE	TITLE	REFERENCE
DOD	Memorandum of Understanding: Methods and Procedures of Life Cycle Analysis	(N/A)
	Solid Waste Management Collection, Disposal, Resource Recovery and Recycling Program	DODD 4165.60
NAVY and MARINES	Energy Conservation Investment Program	NAVFACINST 4101.5
	Energy Managemen	OPNAVINST 4100.5C
	Sale of Utility Services	SECNAVINST 1300.1A
	Secretary of the Navy MWR Resource Recovery and Recycling Program	SECNAVINST 1710.8
	Utility Systems Assessments and Utility Technical Studie	NAVFACINST 11310.45
ARMY	Acquisition and Sale of Utilities Service	AR 420-41
	Energy Program	AR 11-27
	Long Range Utility Systems Plar	TM 420-10-8
	Solid and Hazardous Waste Management	AR 420-47
	Surfaced Areas, Bridges, Railroad Track and Associated Appurtenances	AR 420-72
	Transportation Master Planning	TM 5-803-9
	Utility Services	AR 420-49
	Water Supply and Wastewate	AR 420-46
AIR FORCE	Electric Power Systems	AFI 32-1063
	Electrical Power Plants and Generator	AFI 32-1062
	Electrical Safe Practices	AFI 32-1064
	Gas Supply Distributior	AFI 32-1069
	Grounding Systems	AFI 32-1065
	Heating Systems and Unified Pressure Vesse	AFI 32-1068
	Plumbing Systems	AFI 32-1066
	Providing Utilities to Air Force Installation	AFI 32-1061
	Utilities Systems Planning Bulletir	(AF Bulletins)
	Water Systems	AFI 32-1067

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